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THE

HISTORY OF MEDICINE

VOL. I.

LONDON
PRINTED BY SPOTTISWOODE AND CO.
NEW-STREET SQUARE

THE

HISTORY OF MEDICINE

COMPRISING A NARRATIVE OF

ITS PROGRESS FROM THE EARLIEST AGES TO THE PRESENT TIME

AND OF THE

DELUSIONS INCIDENTAL TO ITS ADVANCE FROM EMPIRICISM
TO THE DIGNITY OF A SCIENCE

BY

EDWARD MERYON, M.D. F.G.S.
Fellow of the Royal College of Physicians of England
Late Lecturer on Comparative Anatomy at St. Thomas's Hospital, &c. &c.

VOLUME I.

LONDON
LONGMAN, GREEN, LONGMAN, AND ROBERTS
1861

TO

THE RIGHT HONORABLE

GRANVILLE GEORGE LEVESON GOWER

EARL GRANVILLE, K.G.

PRESIDENT OF HER MAJESTY'S MOST HONORABLE PRIVY COUNCIL,
CHANCELLOR OF THE UNIVERSITY OF LONDON, F.R.S.
ETC. ETC. ETC.

THE FOLLOWING PAGES ARE INSCRIBED

AS A HOMAGE

TO THE TALENTS WHICH HAVE RAISED HIS LORDSHIP TO POSITIONS

OF HIGH TRUST IN THE STATE,

AND TO THE CHANCELLORSHIP OF ONE OF OUR UNIVERSITIES,

AND AS A TRIBUTE OF GRATITUDE

FOR THE FRIENDSHIP OF MANY YEARS WHICH HAS BEEN ACCORDED TO

HIS LORDSHIP'S FAITHFUL SERVANT

THE AUTHOR

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ERRATA.

Page 55, line 20, *for* "Endemeus," *read* "Eudemus."
,, 56, ,, 10, omit the commas between Aulus Cornelius Celsus.
,, 63, ,, 3, *for* "Attila," *read* "Attalia."
,, 91, ,, 9, *for* "Cavacalla," *read* "Caracalla."
,, 91, ,, 20, *for* "it," *read* "magic."
,, 135–6, *for* "Almaleci" and "Almalechi," *read* "El-Maliki."
,, 234, line 14, a comma to be added before and after Duke of Savoy.
,, 289, ,, 5, *for* "foramen ovalis," *read* "foramen ovale."
,, 301, ,, 14, *for* "Rut," *read* "But."
,, 339, ,, 20, *for* "fifteeth," *read* "fifteenth."

HISTORY OF MEDICINE.

INTRODUCTION.

The purpose of the following pages is to consider the past history, the present state, and the future prospects of the Medical Profession.

To record the names and preserve the memory of those whose great achievements have conferred benefit and lustre on their fellow-men, has in all ages been regarded as a duty, and felt as a gratification to wise and reflecting men; but whilst endeavouring to relate the principal events which have contributed to make the medical profession what it now is — a high and noble calling — it will also be necessary to speak of the prevailing delusions which have been, and still are, practised by the unprincipled, to tempt the unwise and unwary, making largeness of promise a profitable trade, and sinking the profession in name, though not in deed, to a base and degrading craft.

The task which I have undertaken would be comparatively useless were it confined to a mere narrative of events, to excite either our approval or censure; although, if successfully executed, it might furnish precepts to imitate or examples to shun.

I have a far higher object in view, and that object is to set forth, as precisely as my humble ability will admit, the inductive foundation which has been laid down to support the deductive character of the science, if science it may be called; or in other words, to exhibit the nature and amount of scientific, as distinguished from empirical knowledge which has been gradually acquired, relative to the phenomena of life, their relationship with each other, and, when that relationship is disturbed, the data which are necessary to form a really good hypothesis in the administration of remedies for its readjustment, or to determine how far those facts go, to form a solid basis for a pure and exact science.

To show that such an undertaking is not uncalled-for, I need only advert to the anomalous state of the medical profession as it now exists, and to the conflicting systems which have been lately propounded by visionaries and enthusiasts, and blindly followed by the ignorant and unprincipled, who are apt to regard probity as an affair of taste, and society as the patrimony of the most dexterous charlatan. I call it an anomalous state, because it is the only profession in which the practitioner has no competent judge to apportion a due reward for his scientific acquirements, success being his only distinction, and quackery the shortest and most certain road to it. Military and naval aspirants have their superior officers, with skill to decide upon, and authority to dispense rewards to the highest merit; nor are advocates and the clergy less dependent on judges and bishops, who have the ability to estimate and the power to recompense particular excellence. The physician and surgeon, however, are peculiarly obnoxious to other powers than those of right reason, and their highest honours are virtually reduced to a game of chance. In addition to this extraneous drawback, there is an internal source of vexation and discouragement, proceeding from the jealousies of members of the profession itself, so that there are few who pass through a professional life without hearing revelations which must of necessity produce much bitterness of feeling, not unmixed with a sense of degradation, that they should belong to a calling in which such things are possible.

Yet even this state of things may have its advantages; for although the rights of true merit are often disregarded, and honourable conduct is sometimes violated, the spirit of independent research is obviously stimulated, and thus it is that every lawful use of man's powers and faculties is enlisted to build up a science, which, if honestly pursued, may tend to ennoble his intellect and satisfy his reason. It must be admitted, that of all kinds of research which have for their object a knowledge of nature, medicine, as an inductive science, occupies the lowest place; and the reason is obvious. Facts alone have been employed to establish other natural sciences, whilst in medicine the human imagination has been taxed to the utmost in framing hypotheses to accord with or account for the various phenomena which are constantly presenting themselves to the physician's notice. Hence the severe rebuke uttered against it upwards of two centuries ago, that "it is a science which hath been more professed than laboured, and yet more laboured than advanced; the labour having been more in circle than in progression, for I find much iteration, but small addition." And the same sentiment expressed by a modern writer is as painful a commentary on its subsequent progress:—"The nature of medical causation is such that it takes as much time and trouble to rectify an error as to establish a truth. Thus it may require the experience of one man's life to arrive at some plausible theory, and the counter-experience of another man's life to show that it is false."

So grave a reproach is humiliating enough, and demands consideration; and although we must, in some degree, admit the truth of it, yet may we recognise the cause, and hope that the following inquiry may supply us with materials for encouragement, and motives for exertion. Notwithstanding all the conventional irony against the profession, no class of men has exerted itself more disinterestedly in practical philanthropy than have physicians and surgeons, who may proudly boast that science is their only means to assuage human suffering in all its varieties, and in imitation of our Saviour—"to heal all manner of diseases."

In tracing the gradual advancement of the medical sciences, and the ethical relations of the profession, which, happily, have not been neglected of late years, it will be my endeavour to show that those who have laboured most earnestly and most truthfully have never failed to aggrandise themselves, even though they may not have been rewarded by the transitory remunerations of this world's riches. And if in making such a history subservient to the investigation of the comparative merits of the various systems which divide the medical world at the present day, I am enabled to show good evidence that the old and orthodox system of medicine is founded on the clearest reason, the widest experience, and the most practical good sense, I shall consider my labour well rewarded; but if, in arriving at such conclusion, I may exalt, as will hardly be expected of me, the features of a rival system in disparagement of my own, it will be with the earnest endeavour to point out the direction in which future investigations hold out the greatest promise of assistance, and with the feeling that we are strong enough to be generous, if not always wise enough to be just. Though I may be silent on the obligation, yet am I not unmindful of the fact, that I have been assisted at every step by the various authors who have written on the history and progress of medicine; but on most subjects it will be found that I have embodied with my text a reference to the authority from which I have derived my information.

Even this I have deemed unnecessary in the early part of my work, seeing that every encyclopædia will furnish the same details as those which immediately follow; but as I approach the middle ages, when historians as well as critics are liable to err from preconceptions, and the influence which the passions exercise over the judgment, a careful selection and record of authorities is of the first importance. And this is the more apparent at the present time, when the speculation, or even the bare analogy of one day, becomes the scientific induction of the next; when knowledge becomes more accurate, and experience more extended. Hence I shall endeavour to record faithfully the hypotheses which have been of high value as partial interpreters and provisional guides to higher truths, and, to the best of my ability, with that spirit of toleration which teaches men to regard dissidents from received standards of opinion with charity, if not with respect; for no one can be aware how well-founded the opinions he holds are until he has heard all that can be said against them.

CHAPTER I.

EARLIEST CONDITION OF THE HEALING ART.

WHATEVER illustrates the progress of the human intellect, and the achievements of those who have preceded us, is, at least, a subject of legitimate curiosity to every man who desires to elevate his mind to the dignity of his actual condition. Two courses are open to the historian of medical science. Either he may trace the progress of medical theory, which has been perfectly accomplished by Sprengel in Germany, by Rénouard in France, and by Bostock and Alison in England; or he may record the successive facts which have been from time to time contributed, to form an inductive foundation for an exact science.

We cannot afford to dispense with either, both being necessary to the student who aspires to a comprehensive knowledge of the present condition of medicine; for although the one may be little more than a relation of amusing fallacies, and the other an uninteresting epitome of unconnected facts, yet the two are inextricably bound together, and so much so are they that the very nomenclature of the one has been derived from the prevailing fashion of the other. The two being thus combined, naturally lead to the threefold question relative to medicine; namely, what it has been, what it is, and what it may become hereafter.

In the earliest periods of human existence, medicine undoubtedly was based on an instinctive character; just as some animals resort to substances as physic which are unfit to serve them as food; and I think it would require no great ingenuity to show that those diseases to which man in a state of nature would be most exposed, are precisely those in which the instinctive tastes are most developed. How much of truth there may be in the idea that vegetable remedies are of indigenous growth in the very localities which generate the diseases for which these remedies are most applicable; and how far, if true, it may be suggestive of such instinctive appetences, I do not presume to determine; but such questions have their own peculiar interest, not only as regards the special nature of man, but also as showing the reasonable transition from a primitive and natural condition to an artificial one, in which diseases were imputed to mysterious and supernatural causes, and their cures formed part of a religious superstition. This first phasis of medical history Sprengel dates as far back as the Egyptian Isis, who is said to have given unequivocal proof of her divine power by restoring her son Orus to life. She was the symbol of the moon, the changes of which were then thought to cause the recurrency of periodical diseases; and to her anger the Egyptians attributed their physical afflictions. Isis bequeathed her medical potentiality to Orus, who was regarded as the symbol of the sun; whilst Hermes, who was also a son of Osiris, was acknowledged by the Egyptians as equally endowed with divine power.

These two may be regarded as the prototypes of Apollo and Mercury, whose observations and remedial agents the Greeks inscribed on papyrus, and formed into a book, under the title of "Scientia Causalitatis," which eventually became the code to which the practitioners of medicine were obliged to conform; and in so conforming, were exempt from all consequences, whatever might be the issue of the disease; whilst death was the penalty of departure from it, even if the patient recovered.

We can understand the spirit of such implicit trust, when we consider that diseases were imputed to the vengeance of the gods, and that until their anger was appeased all curative appliances were regarded as hopeless. The terror and weakness of the sufferer, moreover, presented a favourable opportunity for the dexterous priest to assume a mediatorial power; and, as an admitted favourite of the deities, not only to implore and obtain pardon, but also to administer remedies which were falsely alleged as immediate revelations. It was thus that the priest became the physician; and even up to the time of Alexander the Great, Serapis was revered as a god of medicine; and it was in his temple at Alexandria that Vespasian performed the miracles which Tacitus records of him. (Lib. iv. c. 81.)

General knowledge as it then existed, for science it could scarcely be called, being thus confined to the priesthood, and transmitted by that class to its own members only, was not in the most favourable condition for advancement; just as when birth or influence obtains what is denied to industry or merit, there is absent the most powerful stimulus to exertion; the dominance of caste being an effectual barrier to the spirit of emulation. It may be presumed that some amount of anatomical knowledge must have resulted from the practice of embalming their dead; but beyond the mere relative position of the viscera of the chest and abdomen, little in the shape of human anatomy could have been learned; for, according to Herodotus, the most careful preparatory process consisted in withdrawing the brain through the nostrils by a curved iron instrument, and in taking out the intestines; but, as the dissection of human beings was expressly forbidden, and the priest who effected the preliminary incision of the body was often assailed with stones and blows (so great was their horror of those who damaged the mortal remains of their friends), no great amount of anatomical knowledge for the practical purposes of the physician or surgeon could have been acquired.

Our information concerning their medicines is very scanty, but M. Pauw, in his "Recherches sur les Egyptiens, etc." (p. 166), has shown that the Scilla was used by them in cases of dropsy, as it is by ourselves at the present day; and an oxide of iron was also employed in similar affections. They thought that disease was generally accompanied by some critical evacuation, and their endeavours were directed to the promotion of such salutary actions. Had they confined themselves to such simple practice, and recorded their observations thereon, how different might have been the state of the medical profession to what we now find it!

The Hindoos, Israelites, and ancient Greeks likewise, attributed their diseases to the anger of their respective gods; and the priests, like the Egyptians, abused the credulity of the people, arrogated to themselves a mediatorial influence, and employed all sorts of ridiculous incantations to support their frauds. Whatever progress was subsequently made, was, doubtless, accomplished by the inherent energy and expansive force of the Grecian mind; but it was not until the time of Hippocrates that medicine could be regarded as a distinct branch of science, although long before the birth of philosophy, medicine had been pursued by the order of priest-physicians, whose origin has been traced to the Egyptians at least. The Greeks selected their demigods from amongst those who embodied most strongly the feelings and aspirations of their fellow-creatures, and of the periods in which they lived. Those illustrious citizens, who possessed the power to conquer, and the genius to instruct, they deified, and built temples to their honour, wherein eloquence first asserted the prerogative of knowledge, and science first developed the germs of discovery. Many of these temples were erected to the glory of those who had acquired celebrity in the healing art; and, like those of Apollo at Delphi, of Diana at Ephesus, and of Ilithyia at Rome, were resorted to for the cure of disease.

Æsculapius, a mythical personage, the reputed son of Apollo and Coronis, and pupil of Chiron the Centaur, is said to have devoted himself zealously and successfully to the pursuit of medicine. He was considered so skilled in the remedial powers of plants, and so miraculously fortunate in the use of them, that he was called the inventor as well as the god of medicine, and received divine honours after death. Festivals, called Asclepia, were celebrated to his memory at Epidaurus, Pergamus, Athens, and Smyrna, and priests were set apart, under the denomination of Asclepiades, to preside over the rites and ceremonies of his altars. Temples were built in the most healthy places that could be chosen, and, when practicable, in the neighbourhood of some mineral spring. They were ornamented with votive tablets, on which were inscribed the diseases which had been successfully treated, and the remedies employed; so that they virtually became schools of medicine.* As all diseases were considered to be the result of divine wrath, so was it supposed that in the temples of the gods the divine power of healing was most likely to be made manifest; and thither, accordingly, did the afflicted direct their steps, after a preliminary purification, which was enjoined as one condition of a successful issue. Faith was also demanded, and with these qualifications admission was granted to the officiating priest, who was surrounded by all kinds of cabalistic symbols, and practised such mysterious ceremonies as were likely to influence the imagination. The recital of marvellous cures, as attested by the tablets, was a fitting prelude to the prophetic sleep which sometimes befel the patients themselves, during which the appropriate remedies were revealed to them; but, if no such sleep occurred, sacrificial offerings and fervent prayers were made; and if these failed, the priests themselves professed to have ecstatical sleeps, and vicarious dreams, which were interpreted to the sufferers. The interpretation of the dreams was, at all times, the duty of the priest, and when all failed, the failure was attributed to deficient faith. The influence of these priests was, doubtless, enhanced by the oriental custom which then prevailed, and more so than ever during the time of Zoroaster the Persian prophet, of studying astrology and magic.

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* The Asclepiades established three famous schools of this description. The first was that of Rhodes, which first failed for want of a succession of ministering officials. Hippocrates does not speak of it, probably because it was in disuse before his time; but Cos and Cnidos flourished simultaneously with the school of Crotona, in Italy, which Pythagoras established. See "Histoire de l'Anatomie et de la Chirurgie, par M. Portal," vol. i. pp. 12, 13. These temples were numerously dispersed throughout Greece, as at Titane, Epidaurus, Cyrene, Orope, Cylene, Tithorea, Tricca, Megalopolis, Pergamus, Corinth, Smyrna, and at many other places.

The Asclepiades had a pretty shrewd knowledge of the value of air, water, light, heat and food, in suitable supplies, as curative agents, and duly administered them; but what shall we say of the mystical ceremonies which were the accompaniments? It would be difficult to find in polite language phrases strong enough to stigmatise according to their desert the abject ignorance and boundless credulity which such practices would lead us to infer as then existing: and yet what a speaking commentary on those customs do usages of the present day afford us! and amongst classes too wherein the excuse of ignorance cannot be adduced in extenuation! The mesmeric clairvoyante now holds her *séance*, as it is called, and by means of a lock of hair, or some equally efficient link between herself and patient, pronounces with oracular authority the nature of the disease; not at all times the most rational, and the appropriate remedy, generally of as uncertain a character as those propounded by Æsculapius and his followers. Instead of the ancient and credulous Grecian, however, the high-born and educated of the nineteenth century are the supporters of the artifice, and give credence to every word which falls from the lips of these fraudulent impostors. They delude themselves moreover by imagining that a special providence permits these so-called supernatural operations, for the relief of suffering humanity. It will be necessary hereafter to examine the foundation of such belief, and to inquire whether it is more rational than the frenzied dreams of the ancient Asclepiades. By the way, however, it may be observed, that if any one of us were to set seriously to work to study the doctrine of probabilities, it would be found that these oracles, in their guesses at truth, approach it just as often as any other person not mesmerised would do with an equal amount of knowledge respecting the subjects, which may be supposed to be the absolute minimum. Predictions and their fulfilment are well calculated to impress the uninformed, whose faith rests on such coincidences; and the *clairvoyantes* hit on them just often enough to illustrate a remark which Mr. Mill has made in his "System of Logic," that "Faith in delusions is quite capable of holding out against a great multitude of failures, provided it be nourished by a reasonable number of casual coincidences between the prediction and the event." The Asclepiades placed their chief reliance on those hygienic observances which prevail more or less at the present day, for the maintenance of health. Temperance, cleanliness, air, and exercise were their great resources; but their medical appliances, apart from their prayers and incantations, were of the most simple kind, and directed chiefly to the cure of wounds. Podalirius and Machaon, the two sons of Æsculapius, accompanied the Greeks to the siege of Troy in the double capacity of warriors and physicians. They paid little attention to constitutional ailments, but directed their care chiefly to external wounds. Thus, of Machaon it is related, when Menelaus was wounded by the arrow of Pandarus, that he

> "Suck'd the blood, and sovereign balm infused,
> Which Chiron gave, and Æsculapius used."

And, when he himself retired from the field severely wounded, he immediately partook of a mess of meal mixed with cheese and wine, practising in his own person the theory which guided him with others, that remedies were meant to profit those only who had some accidental ailment, but sound constitutions; and that if men were not sound, they had better die, and make room for others who were. Podalirius, however, appears to have had more sympathy with his fellow-creatures in suffering, and is reported to have been the first who practised venesection. On his return from Troy he cured Syrna, the daughter of Damætus, of the falling sickness, and married her. For some centuries the practice of medicine was, with jealous solicitude, monopolised by the Asclepiades, many of whom were men of vigorous intellect; but they resigned themselves to visionary speculations, and obeyed the instincts of their understandings rather in crude meditations on the essence of things, the origin of the world, the nature of God, and the soul of man, than in developing a practical and useful system of medicine. During this period the two temples of Cos and Cnidos gradually acquired great repute, in consequence of the conflicting doctrines which were taught in them.

Pythagoras, who was born about 570 years before Christ, did good service to medicine by directing the attention of his pupils to the organs and functions of the body in their healthy state, and the means to be adopted to preserve them so; but in spite of all the benefit which is conceded to him, his doctrine of medicine was as visionary as that of his general philosophy, which was based on a vague conception of numbers, to which he attributed a real existence, and regarded them as the essence of all things. The first great cause, or original unit or monad was, according to his hypothesis, a breathing being, which inhaled the atmosphere of the world, and so became infinite, and capable of diffusing itself into a multiplicity of numbers. From these numbers, according to his views, points were produced (his precise notion however relative to the transmutation of the abstract idea of number into the material substance of points he failed to give) from the points, lines; lines in their turn developed figures; and figures, solid bodies of which he recognised four, viz. fire, water, earth and air; from which he conceived the whole world to be formed. His code of ethics was doubtless of the loftiest description, and as such was made subservient to the preservation of health. He was supposed to be inspired by the gods for the purpose of revealing and inculcating a new course of life to his followers, who were promised, as a recompence for the severe conduct of mental and bodily training which he propounded, the divine favour. He selected Crotona as a favourable place for the propagation of his views, and there he embodied his pupils into a secret sect, who pledged themselves by solemn vows to one another to yield implicit obedience to their common chief.*

We next find Anaxagoras (500 years before Christ) first teaching the distinction between mind and body; and, fifty years later, Democritus acknowledging the distinction, and describing both mind and body as composed of atoms or corpuscles, differing only in their nature and arrangement. Sensations he explained by supposing these atoms, in sensible images, issuing out of one body to converge into another; and mental phenomena he attributed to the progressive and retrogressive motions of such atoms. His contemporary, Empedocles, appears to have adopted this philosophy of Democritus, and to have engrafted some of his own notions on it. The atoms he represented by the four elements acting on each other by the two forces "love and hatred," names which are somewhat suggestive of those forces which are accepted in our own modern philosophy under the denomination of attraction and repulsion. He enunciated, moreover, the doctrine of transmigration of souls. "The soul," says he, "migrates through animal and vegetable bodies, in atonement for some guilt committed in its unembodied state, when it is a demon," the seat of the demon being the blood.

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* In the miscellaneous writings of Lord Macaulay, the system of teaching is thus humorously illustrated:—"Almost all the education of a Greek consisted in talking and listening. His opinions on all subjects were picked up casually. If he wished to study physic, instead of shutting himself up with books, he walked down to the market-place to look for a gymnastic physician."

Of such men was the temple of Cos composed; and having so rich a subject as the human body to expatiate on, ratiocination was a natural consequence; accordingly we find them inculcating the necessity of combining reason with experience in the treatment of disease; and hence were they called Dogmatists.

The spirit of jealousy, which has ever actuated competitors in uncertain sciences, was just as potent in its manifestations amongst the rival physicians of Cos and Cnidos, as in the conquered Grecian, who, by a succession of nocturnal efforts, succeeded in overturning the statue which the citizens of Thasus had erected to Theagenes, and was himself crushed to death by its fall. The moral, too, is not inapposite; for the adversity which befel the athlete has in many instances recoiled on the heads of the malevolent, as was signally exemplified in the case of the ambitious Pythagoreans during the revolt of Crotona.* This event caused the disruption of the sect, and, through the instrumentality of Metrodorus, the secrets of the craft were spread abroad, and so originated the public practice of medicine. He it was, who, about 440 years before Christ, taught publicly the principles of the art which, inasmuch as it was a profitable calling, was eagerly seized on by many, more especially by some philosophers of Italy, who had the good sense to reject the mummeries of the Asclepiades, and to adopt thenceforth rational means for the cure of disease. By this disunion a practice commenced (as we are informed by Schulzius in his "Historia Medicinæ," a rerum initio ad annum urbis Romæ, 535), among physicians of migrating from place to place, and of making an inflated public declaration of their pretensions on first entering any town. These itinerant physicians were called Periodentæ.

Anteriorly, the practice of medicine was maintained as a mystery, in the hands of a fraternity whose genealogy was religiously preserved, and who transmitted its secrets to their descendants almost exclusively; but if any of the laity were admitted into the guild, it was under an oath of fidelity for the preservation of the mysteries of their profession. We cannot therefore wonder that in an atmosphere of secrecy, so little improvement was effected during the centuries which intervened between the time of Æsculapius and that of Hippocrates. This slight sketch will, it is hoped, serve to convey an accurate idea of the state of the healing art during its mystical condition: a state analogous to that of philosophy generally, from which medicine has taken its tone and character in all ages.

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* Geschichte der Heilkunde, 1er Band, pp. 90, 91, von Justus Friedrich Karl Hecker.

The human mind, during the period of time we have been speaking of, was more prone to speculate on the external world and nature than on itself; and the essential characteristic of Grecian philosophy, and of medicine, which formed part of that philosophy, was pre-eminently mystical. Unassisted by any knowledge which books could afford, it originated in the speculations of contemplative and imaginative minds, which laid claim to the sacred gift of inspiration, and demanded in return a blind and irrational acquiescence in all its dogmas, as well as an implicit obedience to all the precepts which a mysterious priesthood inculcated, to propitiate those supernatural agents from whose wrath and vengeance all human ills were supposed to spring. We may, moreover, collect, that from the earliest periods of history, and very probably from the earliest periods of human existence, medicine has been more or less in requisition, just as in the present day we find a medicine man in the rudest and most primitive condition of human society.* May not this be received as pretty conclusive evidence that it is a natural requirement, and not, as some writers have supposed, the result of a corrupt and degenerate civilisation?

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* "The Tla-quill-augh, or man of supernatural gifts, is supposed to know all things, and to be capable of throwing his good or bad medicine, without regard to distance, on whom he will, and to kill or cure by magic at his pleasure. These medicine-men are generally beyond the meridian of life; grave, sedate, and shy, with a certain air of cunning, but possessing some skill in the use of herbs and roots, and in the management of injuries and external diseases. The people at large stand in great awe of them, and consult them on every affair of importance. But their personal safety is not in proportion to their influence. Every misfortune, unseen evil, or sudden death among the people, is immediately attributed to them, and however innocent of the calamity, they are apt to pay for it with their lives."—*Watson, on the Medical Profession in Ancient Times*, New York, 1856.

It may not be uninteresting to observe, that during this early period of medical history the doctrine of the immortality of the soul originated, as a logical consequence, from the speculations of Democritus relative to the composition of body and mind. This first atomic theory and the dogma of indestructibility of matter being admitted, the immortality of the soul necessarily followed; for the soul, according to his theory, being material, or made up of simple atoms, and all material substances being indestructible or eternal, the soul was necessarily eternal or immortal.

Notwithstanding this propensity to speculate on abstract topics, the daily wants of man in the earliest stages of society must have impelled him to make trial of the various productions of nature as articles of food; so that amongst fruits and vegetables some were found to possess one property and some another: and in this way it may be conceived that a system of dietetics originated, and that an accumulation of facts bearing on the subject gave rise to the art of medicine.

> "For nought so vile that on the earth doth live,
> But to the earth some special good doth give;
> Nor aught so good, but, strain'd from that fair use
> Revolts from true birth, stumbling on abuse."

It has been supposed by Schulzius and others, that the Greeks derived their knowledge of medicine in a state of considerable advancement from the Persians; but Dr. Adams, instead of looking on it as an exotic production in the land of Hellas, thinks that it was the offspring of the soil, through the medium of the Asclepiadæ, the earliest practitioners of whom we have any record, who probably accumulated medical knowledge by means of tablets or archives preserved in the Asclepia. And this opinion appears to be supported by the fact, that from the earliest time of which any historic record exists, the Hellenic physicians were in high repute at the court of Babylon; so that, although the origin of Grecian medicine is involved in the most profound obscurity, the resources of the Asclepiades were obviously appreciated over and above the appliances of the Persians, which were chiefly derived from astrology and magic.

CHAP. II.

THE GREEK SYSTEMS OF MEDICINE, FROM THE TIME OF HIPPOCRATES TO THE CHRISTIAN ERA.

Towards the end of the fifth century before Christ, the temple of Cos acquired great renown by the production of an individual among its officiating priests, who was destined to effect a great and permanent revolution in the art of medicine, and to lay the foundation of all its future greatness. Whatever may have been the sentiments of his contemporaries,—for he inveighed with great warmth against all who corrupted medicine by introducing vague hypothesis to account for disease,—the accident of his birth appears to have commanded a certain respect (being acknowledged by his countrymen as a lineal descendant of Æsculapius *), and he was well-nigh adored by many of his followers, for

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* The following mythical genealogy of Hippocrates has been transmitted to us by Tzetzes; but Mr. Grote, in his "History of Greece," insists that it is unworthy of credit:—

Æsculapius was the father of Podalirius, who was the father of Hippolochus, who was the father of Sostratus, who was the father of Dardanus, who was the father of Crisamis, who was the father of Cleomyttades, who was the father of Theodorus, who was the father of Sostratus II., who was the father of Theodorus II., who was the father of Sostratus III., who was the father of Nebrus, who was the father of Gnosidicus, who was the father of Hippocrates I., who was the father of Heraclides, who was the father of Hippocrates II., otherwise called the Great Hippocrates.

Galen declares that his writings should be reverenced as the voice of the Deity. Hippocrates, the second of the name, a son of Heraclides, was born at Cos 460 years B.C., and was the scion of a family which had followed the pursuit of medicine for at least 300 years, and had produced some celebrated physicians before him. Much of the information contained in his writings, and which has been transmitted to us, appears to have been the accumulated knowledge of his immediate ancestors; and it is supposed by competent judges in the matter, that many, if not most of the numerous treatises which are commonly attributed to him, were simply collected and written by him; for he had the great advantage, which can scarcely be appreciated since the introduction of printing, of acquiring a thorough knowledge of the observations of his predecessors; and having, moreover, access to all the records and votive tablets in the temple of Cos, he had peculiar facilities to achieve the honour which is universally accorded to him.

He lived at the most remarkable epoch of intellectual development, having as contemporaries the philosophers Socrates, Plato, and Xenophon; the statesman Pericles; the historians Herodotus and Thucydides; the poets Pindar, Æschylus, Euripides, Sophocles, and Aristophanes; and last, though not least, the sculptor Phidias.

The accuracy with which he himself observed, and the fidelity with which he described the phenomena and progress of disease, have never been surpassed; and, although many of his doctrines are erroneous, they have at least the merit of being greatly in advance of those of his predecessors. It is difficult, however, if not impossible, to determine the precise value of his writings; for when the Ptolemies were forming the celebrated library of Alexandria, an undue value was set on all ancient manuscripts, and many works of inferior authors were collected and sold as the productions of master minds. To this cause chiefly is imputed the mutilation and interpolation of the works of Hippocrates. But Galen, in his time, distinguished and separated much of the true from the false, by collecting several versions and separating the most ancient, and thus enabled us to obtain an insight into the practice of Hippocrates, which may be defined as a rational empiricism. He did not, like Pythagoras and Democritus, frame hypotheses from carefully reasoning, but diligently observed the phenomena of nature, and faithfully drew his conclusions therefrom. He regarded the body, however, as composed of the four primary elements — air, fire, earth, and water, variously combined to produce the four cardinal humours, blood, phlegm, bile, and black bile, to the equipoise of which he attributed health, and to the loss of such balance — disease.

He did therefore indulge in metaphysical digressions, and strange would it have been if he had not, for, having Herodicus and Democritus as teachers, it would have been something superhuman to refrain from such exercise of the intellect; but the concise and laconic style of his writings, reduced generally to the simple statement of inferences from observation, shows that his chief aim was to establish general propositions from individual facts, or in other words, to pursue a course of logical induction; and when his speculative hypotheses appeared to be at variance with his observations, he had the wisdom to cleave to the latter and reject the former. For this cause the empirics of a later period claimed him as the founder of their schismatical sect, seeing that he professed to be guided by observation; whilst the rationalists argued that, as he speculated on the causes and progress of disease, he should be identified with them. As generally happens in such cases, both were right and both wrong, for neither, on the one hand, did he pursue his observations but as a means to deduce from them general laws; nor, on the other hand, did he found his practice on any doctrine of occult causes. He had the sagacity to recognise the importance of studying the natural history of disease, which led to his great power of prognosis. He conceived the chief business of the physician to consist in watching the operations of nature, and to promote or check them; and, in some rare cases, even to counteract them according to circumstances. Perdiccas, king of Macedonia, being affected with love-sickness, was cured by him.

Galen attributes to him the origin of the doctrine of elements; for although, as I have stated, Empedocles enunciated the existence of elements and their active forces, the admixture of those elements as a necessary condition of the animal organism originated with Hippocrates. But how worthless and unsatisfactory were such hypothetical doctrines! Discoveries they cannot be called; for with equal reason might Scheuchzen be regarded as the truthful interpreter of those mute yet expressive evidences of time which modern geology reveals to us, as that the vague surmise of fire, air, earth, and water combining to form the animal body, should be accepted as the discovery of the true elementary constituents thereof.

He gave, in fact, too easy an admission to the doctrine of Empedocles, but he had the acuteness to reject the senseless rites. In this respect no biography suggests more instructive reflections than that of Hippocrates, meagre though it be. He was a profound observer, and a faithful recorder of the phenomena which he saw. He was however fascinated by the speculative doctrines which prevailed, and which, as no one existed to censure so no one scrupled to avow; and the natural consequence followed. Left to the conduct of his own unassisted judgment, which had neither the stimulus of an inductive standard to approve, nor the degradation of fallacious speculation to fear, he lent a too willing ear to the syren charms of the latter, and tainted his philosophy with vain hypotheses. Unlike philosophers in general, whose intellects have penetrated to truths hidden from their own generation, he had not to content himself with the tardy justice of a late posterity, but at once influenced the thoughts and feelings of his contemporaries and received their praise. He had no excuse, therefore, for yielding to the temptations which beset ordinary men. His enemies imputed to him an act, which, if true, tends to show that there is some peculiar influence in the pursuit of medicine, which I am disposed to attribute to the uncertainty of the science, and which warps the minds even of the most successful practitioners towards their brethren, however disinterested they may be towards the public. It has been stated, that having extracted all the information which the records contained in the temple of Cnidos could yield him, he set fire to it, in order that he alone might enjoy a monopoly of knowledge.*

Thucydides informs us that he kindled fires to neutralise the infection of a pestilence which broke out on two successive occasions in Attica, when the skill of the physicians could do nothing else to mitigate it.

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* The above calumny is attributed to Andreas, but Tzetzes states that it was the library of Cos, and not that of Cnidos, which was burnt.

To Hippocrates we owe the first acknowledgement of the principle which he called Nature (φύσις), as superintending and regulating all bodily functions. We may clearly perceive the starting-point of some of his errors, which was the limited knowledge that he possessed of human anatomy. It cannot however be imputed to him as a fault, but as a consequence of the superstitious respect which the Greeks still paid to their dead.

He thought that the arteries contained air, and was ignorant of the communication existing between the large vessels and the heart. He knew but little therefore of the circulation of the blood, and could not appreciate the indications deducible from the pulse. He confounded the nerves with all the other white tissues of the body, such as tendons and ligaments, and knew nothing therefore of those molecular changes which are propagated along the course of the true nerves, whereby we are connected with the external world. He regarded the brain as a glandular mass, serving to secrete pituita or mucus, and consequently knew not that in it resided the source of nervous energy, of voluntary actions, of mental operations, and of the reasoning faculties. These and many other facts in structural anatomy and functional endowments he was entirely ignorant of, and could not therefore have any knowledge of special pathology; but he was profoundly versed in all the external manifestations of disease, and on these he first propounded the doctrine of critical days. His mode of studying disease was founded on a close observation of natural phenomena;

and although we may find in his writings such expressions as the origin and coction of humours, yet were the limits of human reasoning more nearly touched and his remedial agents more skilfully administered than we, as progressionists, are generally willing to suppose. His therapeutical resources were by no means contemptible: the Asclepia were generally built on a high and healthy situation in the neighbourhood of thermæ or mineral springs: on first entering the patient was subjected to a system of purification by bathing, shampooing, abstinence from exciting food, and medicated fomentations. As sedatives he used henbane, hemlock, the juice of the poppy and mandragora; as emetics, hyssop and hellebore; as laxatives, elaterium, scammony, spurge, and the mercurialis perennis.

His aphorisms are manifestly a collection of all the conclusions to which his investigations had conducted him, and give a general view of all that was known in medicine and physiology in his day. They are the most important of all his productions, and, as such, have been translated into all languages of the civilised world. They have been commented on by authors in all ages; and, according to Suidas, are, collectively, "a performance surpassing the genius of man." They have, moreover, the adventitious interest of forming the most ancient manuscript known to exist on linen paper, there being an Arabic version bearing the date of 1100, previous to which parchment and papyrus were used.

The physical speculations of Plato have an interest here, seeing that they were destined to influence the literature and even the practice of medicine at the revival of learning in the fourteenth century.

Plato attached great weight to the numerical theory of Pythagoras, but qualified his adhesion to the Pythagorean doctrine of matter by substituting an ideal formative principle, or emanation of the First Cause, on which he founded a mythical history of creation. He described the world as a living animal, gifted with intelligence and a living soul; and each individual body as composed of four elements, which it received from the elements of the universe generally. "This little body of ours," he writes in his "Timæus," "owes its nourishment, and all that it has received or possesses, to the great body of the world. Now these bodies of ours are animated by souls; and from whence should they derive their souls, if the great body of the universe, which has all the same elements with them, only in far greater purity and perfection, did not possess a soul as our bodies do? Since then we admit in all bodies four sorts of being — the infinite, the limit, the compound of these and the Cause — and since we find in the part of the universe to which we belong, that there are causes which create souls, produce health of body, and effect cures for diseases of the body; and causes which put together other compositions and amend them when impaired; this being the case, we cannot but think that the whole heaven possessing them pure and undepraved, has for its cause the nature of those things which are most beautiful and noble, a cause which may most justly be called wisdom and mind; and as wisdom and mind cannot be without soul, it follows that the world has a soul and mind from the power of the Cause, and that mind is of the nature of the Cause in all things."

This very cursory sketch of the Platonic philosophy will serve to render any future remarks I may have occasion to make on it the more intelligible, whilst it here shows how such abstract speculations were calculated to free medicine from the delusions of superstition by substituting the errors of hypotheses in their place.

Herodicus, another contemporary of Hippocrates, was the first who applied gymnastic exercises to the treatment and cure of diseases. Before his time horse exercise constituted a grand remedy of the Asclepiades; but in an age and country remarkable for moral and intellectual improvement, when force and valour were esteemed above all other qualities, and everything that savoured of effeminacy and luxury was despised, gymnasia quickly became popular, and were regularly superintended by physicians, on whom devolved the duty of prescribing the kind and extent of exercise, as well as the diet and observances of the patients and athletes.

The ministering priests in the temple of Cnidos professed to depend on experience alone in the treatment of disease, and argued that, if reason taught differently from experience, it was injurious; but, if the same, it was superfluous; and on such ground, as we are informed by Celsus, they denominated themselves Empirics. This, the first schism which is recorded in medicine, appears to have originated with Philinus, the pupil of Herophilus, about 250 years before Christ, who according to Galen was the founder of the so-called Empirici. He repudiated the assistance of anatomy and physiology as useless studies, and rejected the Rationalists, as redundant in words, and deficient in the knowledge of the healing art.

Serapion, a convert from the school of Cos, cherished in his breast the spirit of animosity which at all times actuates an apostate, and wrote with great vehemence against Hippocrates, who was the presiding deity of the temple of Cos. He improved the system of Philinus, however, and became a clever experimentalist in the nature of drugs. He was sensible of the inadequateness of personal experience, together with the recorded observations of others in the treatment of disease, and contributed a third power, which is admitted in our most approved systems of logic at the present day: I allude to analogical reasoning; but, as reasoning is at variance with empirical practice, he employed the term analogism, and based empiricism on the tripartite foundation of history, experience, and analogism.

Thus the very fountain-head of medical science is tainted with the germs of empiricism; for at this early period, the two great sects of Dogmatists and Empirics divided its domain in the rival schools of Cos and Cnidos. The empiric started with an argument, which in the abstract is true, though in fact it was fallacious; whilst the rationalist took a higher, but equally fallacious stand for the exercise of the intellect.

The expeditions of Alexander from the hills of Macedonia opened to the Greeks a field of observation, which served to dispel many of their superstitions; and, amongst others, that false devotion to their dead, which restrained them from the dissection of human bodies. It is true they found, both in India and Egypt, other superstitions more irrational than their own; but the very fact taught them to question those to which they had given their assent; and the result was an emancipation from most of them. The peculiar philosophy of the orientals, however, reacted on the Greeks; for, from the time of Zoroaster, astrology and magic were the chief studies of the Persians, and these arts were more or less amalgamated with the mysticisms of the

Asclepiades. Even Plato himself acknowledged their potency. And what more likely to occur to the minds of men in those early ages, than that the myriads of lights in the firmament of the heavens (seeing that they regarded them as created for their own especial use) should be, in some mysterious way, connected with them? The constellations being observed to change with the changing seasons, were naturally associated with them; and as the constitution of the body was also supposed to be affected by the seasons, astrology was as naturally associated with the destinies of mankind. The Christian Hamako, in the "Talisman," is but a type of the men who believed that the course of human events was regulated, and might be predicted, by the movements and influences of the heavenly bodies.

Aristotle, who was a disciple of Plato, inspired his royal pupil with the love of nature, and no means were spared to accumulate the materials for a history of animals. The opportunities which were thus given to Aristotle of comparing the organisation of the lower animals with that of man, led to the refutation of many pre-existing fallacies, and to the establishment of the very important branch of medical science—collateral though it be—comparative anatomy. He pointed out the structural distinction between man and the Quadrumana, or monkey-tribe; he named and described the different portions of the alimentary tube of the elephant, and the names are retained to this day; he described the compound stomach of ruminant animals; he was familiar with the structure of birds, and the development of their eggs during the period of incubation; he doubtless dissected reptiles, for he speaks of many large animals which have three cavities only in their hearts; he observed and studied the habits of many fishes, especially of the sturgeon; the cephalopoda, crustacea, and insecta, were subjects of his research; and, if he admitted some of the errors of his contemporaries, it only shows that he held by such reports until he could combat them by observation. He discovered the contractile action of muscles by opening a living chameleon, and observing the action of the intercostal muscles; he first described the true nerves; but, in some instances confounded the tendons of muscles with them, and regarded the brain as a mere excrescence of the spinal marrow, and not as nervous matter. He first assigned to the heart the origin of the blood-vessels, but failed to distinguish between arteries and veins, which was effected by his contemporary, Praxagoras of Cos, who described the arteries as pulsating vessels, but curiously failed to discover their function, which he imagined to consist in conveying air, as the source of vital force, from the lungs to the heart, and thence, by the aorta and its diverging branches, to the body generally.

Antecedently to the knowledge of the circulation of the blood, as well as of the functions of the nervous and respiratory system, a natural classification of the animal kingdom was an impossibility; but the principal divisions which Aristotle first pointed out are still accepted as such by modern naturalists. As, however, the full development of such classification depended on a vast amount of accumulated knowledge, it would be an absurd homage to place the pretensions of the Stagirite upon an equality with those of Cuvier, Agassiz, or Owen; but when it becomes a question of original power of his mind, and the exercise of it on natural history alone, he will bear comparison with either.

We may trace back to Aristotle the elements of the theory which is maintained by the Progressionists at the present day; for he distinguished the physical world into the two universal principles of matter and form: matter, containing the basis or possibility of existence, and form, the realisation of the same. Form, in short, he conceived to be the potentiality by which matter was elaborated into its various forms—a self-creating agent!

Like many of his predecessors, he mixed up many valuable facts with much useless speculation; an example, if one were wanting beyond those which we see daily around us, of the unvarying will of Providence to remind us of the frail nature of man, by mingling with the truthful inspirations of genius the erroneous fallacies of ignorance; for be the course of advancement in any science ever so great, there are never wanting secondary agencies to diminish their efficiency. This is the more remarkable in Aristotle, seeing that he opposed Plato's characteristic doctrine of "ideas independent of the objects which they represent," chiefly because it opened the door to the dreams of mysticism, and diverted the mind from an accurate observation of natural phenomena. The death of Alexander was the signal for the dismemberment of his vast empire, and the Egyptian portion of it was inherited by Ptolemy Soter.* He was a great patron of the arts and sciences, and founded the celebrated Library of Alexandria, which he placed under the direction of Aristotle. He also established the Alexandrian School, and encouraged therein the dissection of the human body, which formed a marked epoch in the history of medicine, subverting, as it did, many old and erroneous doctrines, by the opportunity which it afforded of more accurate research.*

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* Ptolemy Soter, son of Lagus, one of the body-guard of Philip, father of Alexander, or perhaps Philip himself, and therefore perhaps brother of Alexander. Born about 360 B.C.

"The Asclepiadæ of Cos and Cnidos had discoursed upon the phenomena of disease, without attempting to demonstrate its structural relations; like the sculptors of their own age, they studied the changing expression of vital action almost wholly from an external point of view. They meddled not with the dead. For, by their own laws, no one was allowed to die within the temple. But the early Alexandrians were subject to no such restrictions; and turning to good account the discoveries of Aristotle in natural history and comparative anatomy, they undertook, for the first time, to describe the organisation of the human frame from actual dissections."†

In this school Herophilus taught anatomy from dissections, for which purpose the bodies of all malefactors were appropriated; and the charge was also made against him that he sometimes opened the bodies of living criminals, to discover the secret springs of life; but he was destined to bear the disappointment of all physiologists who have attempted to separate and investigate the different agencies which compose an organised living body.

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* The system of instruction in the school of Alexandria was divided into the four faculties of literature, mathematics, astronomy, and medicine. In literature, Theocritus and Callimachus taught poetry; Hegesias of Cyrene, philosophy; Timocharis, astronomy; Euclid was at the head of the mathematical department; Philostephanus occupied the chair of natural history. In the medical faculty were Cleombrotus of Cos, Herophilus, and Erasistratus. The first of these was in high repute as a practitioner, was sent to the relief of Antiochus when that king was dangerously ill, and after curing him, received on his return a present of a hundred talents, or about fifteen thousand pounds sterling, as a reward from Philadelphus.

† The Medical Profession in Ancient Times, J. Watson, p. 90.

> "By following life, in creatures we dissect,
> We lose it, in the moment we detect."

Together with his contemporary, Erasistratus, he made clear every part of the human body, and he first followed the nerves to their terminations in the spinal cord and the brain.

He traced the delicate arachnoid membrane into the ventricles of the brain, which he thought to be the seat of the soul; he also traced the tortuous sinuses of the dura-mater into the veins, the meeting point of which bears the name of Torcular Herophili. He saw the lacteal vessels, but knew not their use; he attributed to the heart the force and character of the arterial pulsations, and to an affection of the nerves the paralysis of muscles, thus stumbling, as it were, on truth without a knowledge of the complex facts which invest such truth with the character of a legitimate deduction: like an injudicious judge, he assigned reasons which invalidated a perfectly correct judgment. Erasistratus, indeed, is said to have made some strange surmises as to a division of the nerves into nerves of sensation and nerves of motion; but they were vague suspicions, seeing that he assigned to the nerves of motion an origin in the membranes of the brain, and to the nerves of sensation an origin in the substance of the brain itself; he recognised, however, the use of the trachea, as the tube to convey air to the lungs, and gave it its name. Seeing the necessity for the admission of air into the lungs for the purpose of respiration, and observing in dead bodies the empty condition of the arteries, he connected the two facts, and supposed that the air which entered the lungs by the trachea was conveyed by the pulmonary veins to the left cavities of the heart, and thence, by the aorta and its ramifications, to every part of the body. Thus the arteries were supposed to be, like the trachea, simply air-passages, and hence their name.*

As a means of preserving his extensive empire, Alexander endeavoured to incorporate the philosophy of the Persians and Indians with that of the Greeks, and hence the confusion of opinions which occurred in the Alexandrian school; for, with few laudable exceptions, the spirit of controversy took the place of observation, and thus many frivolous hypotheses replaced the study of nature. The public discussions in science and medicine gave to the physicians a great reputation for scholastic disputation, but deprived them of much practical ability. Nevertheless, Alexandria enjoyed its celebrity as a seat of learning and as a school of medicine, until it was taken by the Saracens in 638 of the Christian era. The same rivalry which existed in Greece between Cos and Cnidos arose also between Alexandria and Pergamus, in which latter place Galen was born, and Æsculapius was held in great respect as

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* Histoire de la Découverte de la Circulation du Sang, par P. Flourens, p. 2.

"Before he taught in Alexandria, Erasistratus distinguished himself by discovering the secret ailment of the young Antiochus, son of Seleucus, by observing the acceleration of his pulse during the presence of Stratinice."—*Watson, Med. Prof. in Ancient Times*, p. 85.

[illegible]

one of its most celebrated divinities; and to the jealousy of one of the Ptolemies, who interdicted the export of papyrus, lest the library of Pergamus should excel that of Alexandria, is due the discovery of parchment by Eumenes, and by the commerce of which that kingdom accumulated great wealth. "Thus two of our own words—parchment from Pergamus, and paper from papyrus—stand as monuments of the rivalry in the collecting of books, which once existed between Eumenes of Pergamus and Euergetes of Egypt."*

To so great an extent did the professors of medicine abound in Alexandria, that the expedient of practising special branches appears to have originated there.† Surgery, pharmacy, and dietetics, were the three particular divisions which were first established, and by such partition a great impetus was given to each.

Most operations which are now practised were done in the school of Alexandria; and it is even recorded of Ammonius, that he invented and used an instrument for crushing stones in the bladder.‡

About 150 years B. C. a sect arose under the denomination of Essenes, or, as the Greeks called them, Therapeutes, who studied the virtues of natural substances as curative or poisonous agents. In the application of their remedies, however, they practised on a large scale the mysteries of the Persians. Many of them lived most exemplary lives, and clothed themselves in white garments, like the Pythagoreans before them; but the study of the Essenes was not confined to physicians alone, it was pursued by kings and princes, amongst whom Mithridates was the chief. He succeeded to the crown of Pontus at the age of twelve (123 years B. C.), and whilst engaged in thwarting the intrigues of his courtiers, was always suspicious of being poisoned.* In accordance with the spirit of the age, he studied the history of plants, to obtain a knowledge of the most venomous, by way of turning against his enemies the arts which he believed they were practising against himself, until he became so experienced that he published a book on the subject, which, by order of Pompey, was translated into Latin.† His mother was his first victim. His wife and sister Laodicea soon followed, and after them a whole host of conspirators; until at last, when defeated by his enemies, and betrayed by his own sons, he tried to poison himself; but the same poison which had been effectual in killing two of his daughters proved inoperative on his own person. This subject of poisoning has so often agitated society, more especially when the wicked art demanded for its detection more knowledge than the practitioners of medicine possessed, that I shall have occasion to revert to it from time to time, as deeply interesting to, and in close alliance with, the medical profession.

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* Watson's Med. Prof. in Ancient Times, p. 83.

† "Jam vero medicina apud eos hunc in modum est distributa, ut singulorum morborum sint medici, non plurium: itaque omnia referta sunt medicis. Alii enim sunt oculorum, alii capitis, alii dentium, alii alvi partium, alii morborum occultorum."—*Petri Lambecii, Hamburgenses, Prodromi Historiæ Literariæ*, lib. i. cap. 7.

‡ Philoxenus, a surgical teacher in the school of Alexandria, treats of this branch fully in several volumes. Georgias also, and Sostratus, the two Herons, and the two Apollonii were all improvers in this department. Philotimus, Nileus, and Heraclides declared that they had succeeded in reducing luxations at the hip-joint, a fact which others called in question. Watson's Ancient Medicine, p. 88.

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* Biographie Universelle, Ancienne et Moderne, art. "Mithridates."

† A composition which he prepared and employed as an antidote, and which was known as Mithridaticum, was one of the most celebrated nostrums of antiquity. Pompey, after vanquishing Mithridates, ordered diligent search to be made for the method of preparing this remedy, and according to Serenus Sammonicus it consisted of twenty leaves of rue, a few grains of salt, two walnuts, and two figs, made into a confection, which was to be taken every morning fasting, and a draught of wine after it. Sammon. vol. v. p. 1064.

The investigation and practice of Dietetics were chiefly pursued by Asclepiades, a native of Prusa, in Bithynia, but not of the family of Æsculapius. He is said to have gained his living by grinding at a mill during the night, in order that he might attend lectures on philosophy during the day. After his studies at Alexandria he went to Rome, and applied himself to medicine. He was a sceptic in drugs, which, he contended, injured the stomach and induced complaints more dangerous than those which they were intended to cure. He professed to remove diseases "*tuto*, *cito et jucunde*," by dietetic means, in which he attended studiously to the most minute particulars. Pliny speaks of him as an impudent quack, who accommodated his practice to the luxury and indolence of Rome, by humouring the whims of his patients, and prescribing such remedies as would be sure to please. Exercises, baths, and frictions, together with a change in the mode of living, were his chief resources; and if Pliny was right in regarding him as an adventurer, we may fairly conclude that the same kind of competition existed then as that which induces many men to start up in the same ambiguous character, and with the same dubious success.

Themison of Laodicea, the pupil of Asclepiades, dissented from both Dogmatists and Empirics; asserting, on the one hand, that the science of medicine cannot consist in forming conjectures on occult causes; neither can the observation of experiments alone elicit the true method of treating disease; but that as diseases differ so must the treatment; and then, in violation of his stricture on the principle of reasoning, he propounds three forms under which all diseases may be classified. He embraced in his system the analogism of Serapion; but in yielding to it he plunged deeper into the doctrine of occult causes than the dogmatists themselves. He was the first to describe rheumatism, and to give it a place in nosology. The followers of Themison called themselves Methodici. They took advantage of everything which appeared to be useful in the elucidation of the phenomena of life, and of the treatment of disease. In the study which they gave to anatomy they approached the Dogmatists, and in repudiating all etiology and special diagnosis, they approached the Empirics. They separated themselves from both, however, by deducing their indications of treatment from the general principles, which they denominated *strictum* and *laxum*, on which their analogism was founded, and from which they adopted the name of Methodici, confining themselves neither to the remedies which the study of pharmacy had revealed, nor to the dietetic means of Asclepiades. The Methodici founded all their propositions on the doctrines of Epicurus (341 B.C.), who followed closely in the footsteps of Democritus. Both regarded all matter as made up of eternal and indivisible atoms, which atoms, arranging themselves according to a natural tendency, irrespective of a Creator, produced all physical phenomena, whether of health or disease. The great object of the sect was, to reduce the science of medicine to as few general laws as possible; hence, starting with the above propositions, they referred all diseases either to a state of strictum, or constriction, in which the pores of the animal tissues were supposed to prevent the healthy escape of atoms; or to a state of laxum, or relaxation, in which the pores were supposed to admit too free an escape of atoms. Their remedies were naturally divided into relaxants and astringents. They repudiated the great doctrine of the restorative power of nature in the removal of disease, as propounded by Hippocrates, and trusted entirely to their remedial appliances. They inculcated the use of gymnastic exercises, not only as remedial agents, but also as a means of counteracting the bad effects of increasing luxury and indolence; and although the Gymnasia, in which the exercises were conducted, degenerated, and the subjects, like our modern pugilists, became, as is recorded of them, dull, stupid, and gluttonous, yet can it not be doubted that, under proper and judicious management, the Gymnasia might still be resorted to as a means of insuring a robust habit of body, and a vigorous constitution of mind. From this mere sketch of events, as they successively occurred, it must be admitted that no sooner was a real inductive system suggested by Hippocrates, than it was forsaken for vague speculations on the one hand, and an irrational empiricism on the other; but the one great pathological doctrine of Hippocrates, that the fluids of the body are the primary seat of disease, became the fixed idea, under the denomination of the *Humoral Pathology*, and was maintained as the prevailing opinion of most sects and theorists until the commencement of the eighteenth century.

In tracing the history of medicine as developed by the Greeks, I have exclusively confined my observations to the successive discoveries of anatomical facts, and the assumptions of anatomical fallacies. I have, moreover, endeavoured to show how their various theories and hypotheses were founded thereon. But, inasmuch as the great object of history is to deduce from the past instruction for the future, it may be interesting to inquire what were the prevailing forms of disease, and how they were treated; to the end that we may judge how far our resources have kept pace with the advancing requirements of society, and to what extent they are likely to fulfil the exigencies which the public has a right to expect from every man who pretends to its confidence, and aspires to its guidance. In no class of diseases can these questions be more satisfactorily solved than in the epidemics which have from time to time invaded the human race; for when men are suddenly brought face to face with emergencies, they are apt to lose the fictitious character which the world, or their own habits, may have created, and betray their true nature and capacity. Thus may we ascertain, to some extent, what men really were during the early period of Greek learning, as well as in subsequent ages; whilst, at the same time, we are accumulating facts full of interest and significance, showing how fatal diseases have been engendered and propagated by influences which may have been more or less under the dominion of man, and how they have been diminished, and may be still more so, by arresting the conditions which are now known to be most favourable to their production.

Although the ancient philosophers ascribed pestilential diseases to the immediate agency of the gods, as a judgment inflicted on mankind to punish their misdoings, yet might they have pondered on the suggestive fact, that, whilst epidemics were frequently occurring in Rome, which was situated in the immediate vicinity of unwholesome marshes, called by Tacitus "*Ostienses paludes*," they were of rare occurrence in Greece, where, for the most part, the large and populous cities were built on dry rocky ground, possessing a good natural drainage.

The pestilence, which has already been alluded to, occurred 430 years B.C., and it has been made remarkable from the narration which Thucydides gave of it—a narration which Gail has referred to as a masterpiece of historical writing, and as showing the author to have been at once a philosopher, physician, historian, and poet. It has been invested with additional interest in having been imitated by many ancient chroniclers, such as Froissart, in his description of the "Plague of Paris;" Bocaccio, in the "Decameron;" and Defoe, in his "History of the Great Plague of London." *

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* The following translation, by the Rev. Dr. Bloomfield, is well worthy of the original Greek:—"The pestilence at Athens was said to have previously spread its ravages in other parts, as at Lemnos and elsewhere. Be that as it may, so great a pestilence and so sweeping a mortality of the human race had never elsewhere been known in the memory of man. For at first not even physicians, through ignorance of the disorder, were able to devise any effectual remedy for it (nay, they themselves, from their nearer approach to the sick, died the fastest); nor did any other human art aught avail. And as to the supplications at the temple, or consultations of oracles, and other religious rites, all were alike vain and useless, insomuch that, overcome by the violence of the calamity, the people at last wholly discontinued them.

"The contagion is said to have had its origin in that part of Ethiopia which is situated beyond Egypt, and from thence to have passed into Egypt and Lybia. After spreading over a considerable part of the King of Persia's dominions, it at length broke out suddenly at Athens, and made its first attack in the Piræus, where it

According to Diodorus Siculus, much heavy rain had fallen during the preceding winter, insomuch that

was reported that the Peloponnesians had thrown poison into the wells; for as yet there were no fountains there. Afterwards, it extended itself to the upper city, and then the mortality rapidly increased. And now I leave every one (whether physician or other) to pass his own opinion concerning it." "I shall merely relate the manner of it; and, having been myself sick of it, and seen others afflicted, I shall point out the symptoms of the malady. The season of the year is admitted to have been singularly healthy, as far as regarded other disorders; nay, if any one previously laboured under any malady, it merged and terminated in this. Others, without any apparent cause, on a sudden, and when in perfect health, were attacked first with violent heats about the head, accompanied with redness and inflammation of the eyes. Then the internal parts, both the gullet and the tongue, assumed a sanguineous hue, and emitted a noisome and fetid odour. Sneezing and hoarseness then supervened, and not long after, the malady descended to the breast, bringing with it a violent cough; and when once it fixed itself on the stomach, it excited vomiting, inducing what physicians call discharges of bile, and those, attended with excessive torment. This was, in most cases, succeeded by a dry, empty hiccough, accompanied with strong colicky convulsions and spasms, in some cases immediately ceasing, in others of longer duration. The body did not externally feel very hot to the touch, nor was the skin pallid, but reddish, livid, and bespeckled with minute pimples and running sores. But so burnt up were the internal parts, that the patients could not bear the lightest clothing or the finest sheets to be thrown over them, nor endure to be otherwise than stark naked; nay, they would most gladly have plunged into cold water. Many did so, precipitating themselves into wells, urged by thirst insatiable, and whether they drank much or little it was the same. A restlessness and wakefulness perpetually oppressed them; and so long as the disorder was at its height, the body did not fall away, but resisted the malady beyond all expectation; so that either they died (most of them on the seventh or ninth day of the inward fever) while yet in possession of some strength, or, if they escaped that, then the disorder, descending into the bowels, affected them with violent ulceration and excessive diarrhœa, by which they afterwards were carried off through mere weakness; or, if any survived those greatest the earth was overcharged with moisture, and in many places lakes were formed, which, in the following sum-

dangers, yet the disorder seized on the extremities, and there left its mark, making its attacks, for instance, in the fingers, or the toes, &c.; and many with the deprivation of these, and some even with that of their eyes, escaped with their lives. Nor were there wanting those who, on recovery, laboured under an utter forgetfulness of everything, and knew neither their friends nor indeed themselves.

"For as this was a kind of disorder which baffled all description, nay, even exceeded human nature in the virulence which it exercised on the sufferers, so in the following respect it plainly evinced itself to be something wholly different from any of the ordinary distempers. For though there were many unburied corpses, those birds and beasts which prey on human flesh either approached them not, or, if they tasted, perished. A proof of which was seen in the total disappearance of all birds of prey, which were found neither about the carcasses nor elsewhere. But the dogs, from their domestic habits and familiar intercourse with men, afforded a more manifest evidence of the thing. Such, then (to omit many other cases of peculiar violence, each having some symptoms differing from those of others), was the general nature of the disorder. And none of the usual or endemic maladies made their attack during its continuance, or, if they did, soon terminated in this. The sufferers, moreover, died, some under neglect, others with all the care and attention possible; nor could any one remedy be devised, whose application would be certain to do good; for what benefited one, was prejudicial to another. Moreover, no constitution, whether in respect of strength or weakness, was found able to cope with it; nay, it swept away all alike, even those attended to with the most careful management. But the most dreadful part of the calamity was the dejection of mind which overwhelmed those who felt themselves attacked (for falling at once into despair, they the more readily gave themselves up, and sunk without a struggle), and that they dropped, filled, like diseased sheep, with infection communicated by their attendance on each other. That circumstance, too, occasioned most of the mortality; for if men forbore, through fear, to visit the sick, they died forlorn and destitute for want of attendance, and thus whole families became extinct; and if they ventured to approach they met their death, and this was especially the fate of those who aimed at anything like virtue, since they, ashamed of mer, heating and putrefying, sent forth thick fetid exhalations. This occurred in the second year of the

selfish caution, were unsparing of their own lives in attending on their friends; for at last even their servants, overcome by the excess of the calamity, were wearied out with the groaning and lamentation of the sick and dying. Those, however, who survived the disorder were the more compassionate to the dying and the afflicted, both as knowing by experience what the disorder was, and being now themselves in safety. For it never attacked the same person twice, so, at least, as to be mortal. And such persons were felicitated on their escape by others; and they themselves, amidst their present joy, nourished a sort of light hope for the future that they should never hereafter be destroyed by any disease. An overcrowded population compelled people to live in stifling huts, and hence a horribly confused mortality occurred, insomuch that corpses lay stretched out, one upon another, as they had died; and half-dead corpses were seen tumbling over each other, both in the streets and about every fountain, whither their rage for water had hurried them. The very temples, too, in which they had hutted, were full of the corpses of those who had expired there. For as the violence of the calamity exceeded all bounds, and men knew not what to have recourse to, they fell into a neglect alike of sacred and social duties. All laws, too, and customs which had been in force respecting sepulture, were confounded and violated; men burying just where and how they could, and many, for want of funeral necessaries, (so many deaths having before occurred in their families), had recourse to very indecorous means for the interment of their friends. For some, resorting to funeral piles which were raising for others, would, before they were completed, lay their own corpses thereon, and set them on fire. Others, when a corpse was burning, would toss upon the pyre another, which they had brought with them, and go their way. This pestilence, too, in other respects, gave rise to that unbridled licentiousness which then first began to be prevalent in the city; for now every one was readier to venture openly upon those gratifications which he had before dissembled, or indulged in secret, when he saw such sudden changes. The rich hurried away, and those, who before were worth nothing, coming into immediate possession of their property; insomuch that men were willing to snatch the enjoyment of such fugitive delights as offered themselves, and to live solely for pleasure, regarding their lives and their pos-

Peloponnesian War, when all the inhabitants of the Athenian territory crowded into the city, to avoid the destructive ravages of the Lacedæmonians; and to this circumstance the enemies of Pericles attributed the disaster. It never entirely ceased before it broke out a second time, and continued for the space of an entire year; and then it was that Hippocrates caused fires to be kindled to neutralise the infection.

It is obvious, from the above description, that the resources of the Greek physicians were unequal to the emergency, and that, too, when the Greek school was in the very zenith of its glory. Supplications in temples, consultations of oracles, and other superstitious rites, were chiefly relied on; and when they failed, a despair and demoralisation ensued, which it would be very consolatory to think attributable to their peculiar religion, were it not that Froissart has recorded the self-same result of the plague in Paris in the fourteenth century of the Christian era.

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sessions as only held by the tenure of the day. As to bestowing labour or pains on any pursuit which seemed honourable or noble, no one cared about the matter, it being uncertain whether or not he might be snatched away previously to the attainment of his object. In short, whatever any person thought pleasurable, or such as might in any way contribute thereto, *that* became with him both the honourable and useful. No fear of gods, or respect for human laws, operated as any check; for as to the former, they accounted it the same to worship or not to worship them, since they saw all alike perish; and as to the latter, no one expected that his existence would be prolonged till judgment should take effect, and he receive the punishment of his offences; nay, they supposed that a far heavier judgment, already denounced against them, hung over their heads, and before it fell upon them they thought it right to snatch some enjoyment of life." — *The History of Thucydides, translated by the Rev. J. T. Bloomfield, D.D.* vol. i. p. 398 et seq.

CHAP. III.

THE HEALING ART AS IT EXISTED IN ANCIENT ROME.

The early annals of Rome having been written many centuries after the events which are recorded, this portion of its history is necessarily of a legendary character, and therefore embraces, with some measure of truth, a considerable amount of fiction. Numa Pompilius, for instance, like the Egyptian Orus, was supposed to possess a supernatural knowledge of future events, imparted to him by Egeria during their nightly meetings in the sacred grove; and to have founded a sacerdotal college of augurs, for the purpose of observing and reporting on the phenomena of nature as good or evil omens, not only in relation to public events, but also to the affairs of private individuals. Twelve youths were sent to Etruria every year, for the purpose of learning the art of divination (a no mean accomplishment in the practice of medicine); and it was imagined that Jupiter revealed the foreshadowings of coming events by such accidents as the flight of birds, the appearance of the bowels of human victims, or the enigmatical passages of the Sibylline books. The eagle, the heron, and the dove, were esteemed as heralds of good; whilst the owl, the swallow, and the jay, were regarded as inauspicious. In taking the auspices, the augur, clad in ceremonial garments, went out at dawn of day to an open and elevated spot, and with his face to the south, marked out the heavens into four regions with his crooked staff. The north-east was the most fortunate quarter; and there, if a flash of lightning occurred, or a dove was seen, it was hailed as a happy omen. On such circumstances as these, and others equally irrational, did the Romans depend for relief during the successive outbreaks of pestilential diseases, of which about thirty are recorded by Noah Webster, in his "History of Epidemic Diseases," as having occurred between the periods of the foundation of the city and the birth of Christ. On one of these occasions, as narrated by Plutarch, the disease killed instantly, without any previous illness; cattle and trees were not exempt, and it was even said to have rained blood: the citizens of Rome were made to believe that a brazen target had descended from heaven into the hands of Numa to check the pestilence; whereupon he instituted the Salii, or twelve dancers, to whom was confided the care of the target.

With all their superstition, however, the Romans had the sense to acquiesce in the opinion of the unwholesome position of their city; and they dug enormous cloacæ, or receptacles into which the stagnant waters were drained; but it does not appear that each individual house had such a sewer for its outpourings. In the year 464 B.C., says Livy, "a pestilential disorder spread itself, not only through the city, but over the country, affecting both men and cattle with equal malignity; the violence of the disorder was increased by admitting into the city the cattle, and also the inhabitants of the country, who fled thither for shelter from the enemy's ravages. Such a collection of animals of every kind nearly suffocated the citizens by the intolerable stench; while the country people, crowded together in narrow apartments, suffered no less from the heat, the want of rest, and their attendance on each other; besides which, mere contact served to propagate the infection." * On another occasion, according to Livy, about 366 years B. C., or in the year of Rome 383, when a desolating plague of three years' duration carried off, at its height, as many as ten thousand victims a day, recourse was had to the Lectisternum† (a ceremony which consisted in placing the statues of Apollo, Latona, Hercules, Mercury, and Neptune, on three beds, and serving them daily, for eight consecutive days, with rich and magnificent repasts), but without success. In their extremity, some old citizens suggested an ancient practice of driving a nail into the wall of a temple‡; but the plague went on, and the year after the earth opened, and exhibited a vast chasm in the midst of Rome, into which Martius Curtius precipitated himself for the salvation of the city.

Some few years after (331 B. C.) an epidemic pervaded the city, which was supposed to proceed from corrupt air; but it was observed that the principal patricians only were the victims.§ Their deaths, however, were attributed to infection, for poisoning was then scarcely known in Rome, nor was there a law for its punishment. In the general grief, a female slave presented herself to the edile curule, Q. Fabius, and accused more than twenty Roman ladies of poisoning; designing specially

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* Livy, lib. iii. 6.

† Noah Webster, History of Epidemic and Pestilential Diseases, vol. i. p. 60. London, 1800. Sprengel refers the first Lectisternum to 396 B.C.

‡ Ibid. loc. cit.

§ Ibid. p. 65.

Cornelia, a lady of an illustrious family of that name, and Sergia, another patrician lady. It is recorded that as many as 366 ladies were similarly accused; but Cornelia and Sergia were detected in compounding their fatal potions.* When led before the popular assembly, they maintained that the preparations were healthy remedies. The slave, seeing herself accused as a false witness, asked that the two ladies should be required to swallow their own potions; which they did, and, by so doing, avoided a more shameful death. The expedient of the slave was not altogether unworthy of imitation.

When Greece, or rather the cluster of Greek republics, became absorbed in the Roman empire, which spread itself over the whole known world, and engrossed all the learning and civilisation of the period within itself, the Romans themselves had the good sense to see and appreciate the vigorous impulse which prompted each individual republic to rival its neighbour in the arts and sciences; and, although the Romans were so purely an imitative race that all their early customs were essentially Greek, and their opinions were so moulded to those of the Greeks, that they are reported to have given practical effect to the opinion of Plato, who considered it to be a great sign of an intemperate and corrupt commonwealth "where lawyers and physicians do abound;" yet the peripatetic philosophy of Aristotle greatly prevailed; and the obscurity of his writings permitting so many errors to creep in, it soon became a scheme of frivolous and subtle speculations, well adapted to nurture the superstition which was the great characteristic of the Roman mind.

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* Biographie Universelle, art. "Cornélie."

Fortunately, some of the most pestilential diseases did not occur in Rome at a very early period of its existence; for the real plague was a disease peculiar to Egypt, and it was, doubtless, the prevalence of that malignant disease in that country which occasioned the minute injunctions of Moses in regard to washing, cleansing, and purifying the person. The Romans had no intercourse with Egypt until about 480 years B. C., when Hamilcar was sent forth from Carthage to subdue Sicily; for, although Egypt was the emporium of corn, up to that time the Romans drew all their supply from Italy and Sicily; so that the epidemics of Rome were the natural productions of Rome itself. But the plague appeared subsequently, and made such dreadful havoc on one occasion (B. C. 144), as described by Orosius in his "History of the World," that the dead bodies lay putrefying in the streets and houses, and rendered it impossible to approach the city. This visitation was, probably, the same as that which Pliny recorded[*], when all the absurd rites which I have described were practised with most implicit faith, and none more so than the consultation of the Sibylline books, which were supposed to contain the causes and issues of all human calamities, as well as the more important fate of the Eternal City itself. But when all these failed, they gladly flew to untried powers and to unknown gods for deliverance from their troubles. An instance of this blind and superstitious reliance is recorded by Livy in relation to the plague which occurred about 296 years B. C.

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[*] "Pestilentia, quæ priore anno in boves ingruerat, eo verterat in hominum morbos. Qui inciderant, haud facile septimum diem superabant: qui superaverant longinquo, maxime quartanæ implicabantur morbo. Servitia maxime moriebantur; eorum strages per omnes vias insepultorum erat. Ne liberorum quidem funeribus Libitina subficiebat. Cadavera, intacta a canibus ac vulturibus, tabes adsumebat; satisque constabat nec illo, nec priore anno, in tantâ strage boum, hominumque, vulturium usquam visum." See also Noah Webster, vol. i. p. 81.

The senate, deputed to consult the Books on the occasion, discovered a command that the worship of Æsculapius should be transferred from Epidaurus to Rome; and an embassy was despatched, in accordance with such authority, for the respectful conveyance of the statue of the god.* On the introduction of the deputation into the temple, it is said that a serpent glided from under the chryselephantine (gold and ivory) statue of the deity, which was, of course, supposed to be an incarnation of the god himself, and, *as such*, was transported † to an island in the Tiber, on which his temple was forthwith erected, and the epidemic stayed. It was in consequence of this occurrence that Æsculapius is represented with a serpent; and a modern author, with a certain appearance of irony, has suggested that the knotted stick may be regarded as a symbol of the knotty questions which constantly suggest themselves in the course of medical practice.

Another impressive illustration of this gibe occurred about sixty-one years B.C., when Pompey returned to Rome to celebrate the triumph he had achieved in Syria. He introduced with the prisoners who attended him, the elephantiasis of the Greeks, which many authors have supposed to be the leprosy of the Hebrews, as described by Moses in the thirteenth chapter of Leviticus.* These frequent outbreaks of epidemics, and the absence of efficient remedies for their cure, afforded a pretext to Plato, who so abhorred physicians, whom he regarded as the associates of effeminacy and corruption, for declaring that the early Romans refused them admission, for the space of six hundred years, into their city. This, however, was not so.† The profession may have suffered in reputation in consequence of the inflated pretensions of many of its members, and Plato made a handle of their disrepute to display the shrewdness and tact which invariably characterise a cutting sarcasm. We read of one Archagathus, for instance, from whom so much was expected and so little obtained, that, in a fit of petulant disgust, the people banished him from Rome; and others may have been served the same, so that it is possible neither the account of Plato nor that of Drelincourt is absolutely true, and we ought not, perhaps, to attach implicit faith to either.

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* Penny Cyclopædia, art. "Æsculapius."

† Perhaps "swam" would have been a more correct expression —"in insulam transnavit."

That the medical men of ancient Rome occupied a very subordinate position, there can be no doubt: and the reason is obvious. They were men with little or no education, and they were, consequently, but little esteemed. But it became the custom amongst the Greek physicians to migrate thither for the purpose of practising their profession, which gradually assumed a more respectable aspect, and eventually Julius Cæsar bestowed the rights of Roman citizenship on all practitioners in the city. Subsequently, Augustus, after his recovery from a severe illness, conferred the honour of knighthood on his physician Antonius Musa, and exempted all other physicians from the payment of taxes and other public burdens.

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* Encyclographic des Sciences Médicales, vol. xi. art. "Elephantiasis."

† See Drelincourt. Apologia contra Calumniam: "Medicos sexcentis annis Roma exulasse;" 1672.

At the commencement of the Christian era, the inhabitants of Rome appear to have been very much in the same condition, as far as their sensual pleasures were concerned, as are those of London and Paris at the present day: they enjoyed and abused the advantages of wealth, and suffered, as men suffer now, in consequence. Every luxury that art could invent and wealth command was indulged in, and the capital itself was inundated with practitioners of various degrees and sects; some promising largely, like Asclepiades, whilst others mystified the public by propounding new doctrines, which were as senseless and unreasonable as many which are proclaimed at the present day, and some, even then, deserved as little credit for originality.* Astrology and every other form of quackery was practised, nor were men wanting, who, like Endemeus and Thessalus, vilified their brethren with the imputation of fallacies to the total disregard of honesty and truth.

With such incentives from its own internal jealousies and schisms, it is no wonder that the medical profession was ridiculed then, as it is sometimes now, by those who had no need of its assistance; nor is it difficult to trace, in the epigrams of Martial, a triumph, if such an expression may be used, over the absence of grateful motives.*

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* Asclepiades was a native of Prussa, in Bithynia. Cicero alludes to him (De Oratore) as his personal friend, and the most popular physician of the city; celebrated as much for his refined eloquence as for his skill in physic.

Suetonius also refers to Asclepiades (Octav. August, cap. 59) as having more than any other individual raised the medical profession in Rome to the confidence and respect of the people.

Of the different sects above alluded to, the opinions of the Methodists prevailed in Rome from the time of Themison; yet, although a step in advance was made by that school in general therapeutics, by deducing indications of treatment from analogies in symptoms, as a sect they were not celebrated for their learning, notwithstanding a few honourable exceptions, such as Aulus, Cornelius, Celsus, and Soranus.

The former was supposed by Bianconi to have been merely a secretary of Tiberius, and to have compiled a large and comprehensive work, of which his treatise on medicine is but a small part. It informs us of the opinions and practice of the Dogmatists and Empirics, as well as of the Methodists; but to Cælius Aurelianus, also a Methodist, we are indebted for a more perfect knowledge of their exact system, which acquired its highest degree of popularity and estimation under the teaching of Soranus.

Celsus lived in Rome during the reigns of Tiberius, Caligula, Claudius, and Nero. It has been disputed whether he practised any branch of medicine; and if we determine in the affirmative, it is only because we cannot conceive that a mere amateur would have been at the pains of acquiring such perfect knowledge, as he had, of the dogmas of the different sects of physicians, or would have been able to describe the diseases he treats of with so much accuracy, or laid down the most approved methods for curing them that were then

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* Need we refer to the epigrams in Hippocrates on Symmacus, on Carus, and on Hermocrates, to show how easily envy rankles into abuse?

Celsus an amateur doctor as Virgil an amateur farmer

known. His work * contains, in an epitome, everything that is valuable in the writings of Hippocrates, which he also translated into pure and elegant Latin. In medicine he approved and followed the doctrine of Asclepiades; but the most valuable part of his treatise is that which relates to surgery, in which we find methods of practice laid down, and modes of performing several operations described; as, for instance, the lateral operation for stone, and couching for cataract, in the manner still used, with some improvement. In his third book he gives abundant evidence that very active measures were adopted in the cure of pestilential and ardent fevers. Hence it must not be inferred that the Romans were absolutely ignorant of any rational system of treating the formidable epidemics to which they were so frequently a prey.

Had it been the decree of Providence that any one science should advance irrespective of others, and in proportion to the number of intellectual men engaged in its pursuit, how bright would have been the lot of medicine, even at the dawn of the Christian era! But history exhibits it advancing in corresponding steps with other sciences: for a philosophical habit of thought had established itself among physicians, and they enlisted themselves under various schools, which either advocated the Epicurean theory of atoms, or professed Stoical dogmas, or inculcated the tenets of Scepticism. On the other hand, to ward off or alleviate disease was still considered as something superhuman, and the studious habits which this pursuit naturally engendered

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* "De Re Medicâ." This work, written in elegant Latin, is still the delight of medical men; there have been many editions published, the most esteemed being the Aldine edition, 8vo., 1528.

exercised a great influence on the philosophical opinions of the age.

The mystical phasis was, as M. Cousin has described it, characterised by a synthetical method*, or in other words, by the habit of attributing to certain combined agencies, which were very imperfectly known, the abstract nature and final cause of all things; but, in the fifth century B.C., Socrates originated a more correct mode of investigation, by attempting to reduce things to their ultimate elements, and to study all natural phenomena in their most simple forms, as presented to his senses, rather than by indulging in the visionary speculations of his predecessors. He practised, in effect, a method of analysis or induction, and thereby introduced the first stage of that sensual philosophy, which acquired the data for its perfect development in the seventeenth century by the combined efforts of Bacon and Descartes.

Hippocrates was a contemporary of Socrates, and was doubtless influenced by the new system which the latter promulgated. Without extenuating the merits of the former, it may very reasonably be supposed that he seized on that system which was so obviously calculated to test the merits of speculative philosophy in medicine, on the one hand, and of empiricism on the other. He embraced it; and, elevating by its means empiricism to philosophy, he brought down speculative philosophy to the details of empirical observation.

By thus combining the two, he established medicine as a distinct science, and impressed on it that character which M. Auguste Comte describes as the theological phasis.*

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* Cours de l'Histoire de la Philosophie, par M. V. Cousin. Paris, 1841.

Just as Pythagoras elevated mystical philosophy to the highest state of perfection by repudiating the multitude of undefined agencies of Eastern philosophers, and by substituting one great cause or original unit, so Hippocrates raised the theological phasis to its culminating point, by attributing to one divinity, "Nature," that providential superintendence whereby the even course of events and man's health were maintained, and by whose disturbed forces all aberrations were produced.

No sooner, however, had Hippocrates showed the importance of observation, and established medicine as an inductive science, than it was again debased by the speculations of conflicting sectarians.

The new discoveries in anatomy were made the foundation for discussing the cause of functions in health and disease; and, as these rhetorical disputations were not based on sufficient data, conflicting theories became rife, and schism quickly followed; hence Dogmatism and Empiricism.

The Dogmatist paid great attention to anatomy, and speculated on the vital functions as well as on the occult causes of all deviations from health; whence he enunciated the idea of indication in the treatment of disease, and improved general therapeutics by founding them on fixed and rational principles.

In opposition to the dogmatical physicians, and to the confusion in which their preconceived interpretations of experience threatened to involve medicine, the

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* Cours de Philosophie Positive, par M. Auguste Comte, vol. i. p. 12.

Empiric, whose purpose it was to adhere strictly to experience without entering upon any philosophical investigation of principles, disregarded anatomy as useless, and the *causes* of disease as superfluous: he, however, stood on much higher ground than the charlatan of the present day; for he was required to know the different philosophical dogmas in order to combat them, and depended on the observations of others in the treatment of disease where his own experience failed him; and if he encountered a new disease, in which neither his own observations nor those of his predecessors availed him, he appealed to a system of analogism for the treatment, and tested its merits by subsequent observation. The difference, however, between Dogmatists and Empirics was more verbal than real; for the actual practice of the two sects was very similar.

If we attempt to define the precise facts on which the art of medicine was then based, the sum and substance of them must appear lamentably small, considering the number of years which were spent in the pursuit of them. The human mind was more beguiled by phantoms than exercised by observation, and almost every dogma which was advanced was worse than simply erroneous, because many facts were distorted to tally with their delusions.

It was a theory of the early Egyptians, that some critical evacuation was the turning point of disease, and the introduction of many remedial agents in the shape of evacuants was the result. Of these the squill was one, and it is still employed at the present day.

To Hippocrates all honour is due for studying and describing what may be called the natural history of disease, and for the aphorisms which he bequeathed to his followers. Aristotle, Herophilus and Erasistratus observed and accumulated certain anatomical facts, which formed the foundation of physiology.

They knew that the bones were the passive organs of support and locomotion; but they knew not the beautiful process of their development, nor the condition of their perfect structure. They knew that contractility was the essential endowment of muscles, and that by this property every movement of the body was effected; but they knew nothing of the ultimate muscular fibre. They believed that the nerves communicated to the muscles their power and energy of action, and stumbled on the truth of there being nerves of sensation as well as nerves of motion; but they knew nothing of the anatomy and structure of either brain or nerves. They knew the purpose served by the alimentary canal; but they knew nothing of the apparatus by which the nutritive fluid was elaborated: and although Erasistratus saw the lacteal vessels, he knew not that they conveyed the elaborated fluid from the intestines into the blood-vessels. They knew that the heart was the starting point of the arteries; but they knew nothing of the circulation of the blood. They knew that a constant supply of atmospheric air to the lungs was necessary for the maintenance of life; but they knew not that it was for the conversion of venous into arterial blood, and for the generation of heat. They knew that the kidneys were organs of excretion; but they knew not their structure, nor the peculiar nature of the effete elements which it is their office to carry away. They knew the general character of those organs by which the higher classes of animals are perpetuated on the earth's surface; but they knew nothing of the beautiful phenomena of embryology.

They deluded themselves with the erroneous notion that the heart and arteries were subservient to the circulation of the Pneuma or vital spirit through the body; that the heart itself was the seat of the soul; the liver the centre of all emotions and desires; and the brain they degraded to the condition of a mere gland.

When we look back to the achievements in medicine of the early Romans, it is with a painful consciousness of their imperfection; for neither did they add to the store of knowledge possessed by the Greeks, nor did they give practical effect to the doctrines which these latter had advocated and nursed into popularity. The profession was exercised by men who lacked the dignity and independence of character so essential for its successful pursuit, whence much of the decadence which it will be my duty to record in many subsequent pages; and it must be confessed, that the satires of Martial, to say nothing of many other Latin poets, as well as the contemptuous way in which Cato and Pliny speak of our profession, were not altogether unmerited.

CHAP. IV.

MEDICAL SECTS AMONG THE EARLY CHRISTIANS.

About the time of Christ, when the Methodists enjoyed their highest degree of popularity, their fundamental doctrine was called in question by Athenæus of Attila, who, instead of accepting the combination of primitive atoms as the condition of health and disease, revived the Platonic theory of the existence of an immaterial, active principle, called Pneuma or spirit. Aristotle, as we have already seen, described the channel by which this hypothetical pneuma obtained access into the blood-vessels, and Praxagoras explained thereby the theory of the pulse, which he supposed to depend on the dilatation and contraction of the arteries during the passage of the pneuma.

Those physicians who could not accept the doctrines of the Methodists, joined the Pneumatists; and so enthusiastic were they in their respective creeds, that Galen at a later period said of them, "they would rather betray their country than abjure their opinions."

These conflicting theories gave rise to a sect who thought that no one system was absolutely true nor absolutely false; but as they were unable to point precisely to that which they conceived to be true, or to that which they suspected might be false, they established no general theory of their own, but claimed the right of private judgment in each particular case, professing to select the good and avoid the bad. In accordance with their profession they denominated themselves Eclectics. Their condition was one of doubt and uncertainty; but as they had no fixed principle, they escaped the process of refutation, whilst they oscillated between the Dogmatists, Empirics, and Methodists, aiding neither, but introducing new terms which complicated all. Archigenes of Syria was the chief of the Eclectics. He obtained a great reputation in Rome under Domitian, Nerva, and Trajan, and is honourably mentioned by Juvenal, his contemporary, as well as by Galen. Many Empirics, Methodists, Pneumatists and Eclectics, dissatisfied with the arrogant tenets of the Dogmatists, made common cause against them, and united themselves with a sect whose philosophy consisted in a suspension of judgment, not only in relation to an external physical world, but also in that of their own personal existence. This systematic scepticism is shown by Ritter* to have had great influence on, and to have been intimately connected with, the development of the art of medicine; and not a little, perhaps, with some of its delusions, seeing that the number of physicians who subscribed to it was very great.

From the time of Pyrrho downwards, we have a catalogue of Sceptics; but the succession of the school was broken for a time, until it was revived by Ptolemy of Cyrene, who had Heraclides and Sarpedon as pupils.

Ænesidemus, a disciple of Heraclides, gave to the Sceptical system a new and solid foundation; and the new Sceptics, collectively, were physicians, since all those of the sect of whose circumstances in life we know anything — and these form by far the majority — were so.*

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* Ritter's History of Ancient Philosophy, vol. iv. p. 260. Translation by A. J. W. Morrison, B.A.

The Sceptic maintained that nothing could be known and nothing demonstrated †, and therefore refused to speak positively on the existence of a real entity.

> "He would not, with a peremptory tone,
> Assert the nose upon his face his own."

The fallacy and extravagance of the system were never better exemplified than when Hume, the greatest and most legitimate sceptic of the eighteenth century, accepted the forcible and conclusive arguments of Bishop Berkeley in disproof of an external material world, and applied them to prove the non-existence of mind. In thus making a clean sweep of both mind and matter, he made the absurdity of the doctrine to carry with it its own refutation. It was also inimitably ridiculed by Molière ‡, where Sganarelle reproves Marphurius, whom he had just before soundly beaten, for speaking too positively on the fact: "Corrigez, s'il vous plait, cette manière de parler. Il faut douter de toute chose, et vous ne devez pas dire que je vous ai battu, mais qu'il vous semble que je vous ai battu."

We have no positive date of the precise period when scepticism was in the ascendant; but Ritter shows satisfactorily enough that it must have been from the dawn to about the close of the second century of the

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* Ritter's History of Ancient Philosophy, vol. iv. p. 260. Translation by A. J. W. Morrison, B.A.

† Ibid. vol. iv. p. 275.

‡ "Mariage Forcé," Act i. Scene 8.

Christian era; for it was a leading feature with the Sceptics to contrast their own views with the opinions of every other school of philosophy, whether half extinct or still flourishing; and Ritter has thence deduced a tolerably correct account of their course and duration.

Sextus, a Greek philosopher of the empirical school, and therefore surnamed Empiricus, traced the history of the material grounds of scepticism*; and his fame rests on the circumstance of his having given the most complete collection of sceptical arguments against the Dogmatists; from which we may clearly see that the sceptical school must have been formed at a time when the stoical school exercised the greatest influence on scientific thought, for the stoical school was the chief object of their attack. Now the stoical philosophy began to decline about the close of the second century; and by the middle of the third century every other system of philosophy was overshadowed by neo-Platonism.† And this inference is corroborated by the writings of Galen against the Empirics, which are only directed against Menodotus (one of the later Sceptics); while in a later work he mentions Herodotus, the disciple of Menodotus, but makes no allusion to Sextus Empiricus, the disciple of Herodotus; and as he collected into one book the whole of the sceptical doctrines, and Galen does not mention him, we must conclude that Herodotus was a contemporary of Galen. Reckoning, therefore, backward, Ænesidemus may have lived about the commencement of our era.‡

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* Sexti Empirici Opera. Pyrrhoniarum Institutionum. Cum Henrici Stephani versione et notis, etc., Lipsiæ.

† Ritter, vol. iv. p. 260.

‡ Ibid. p. 261.

The introduction of Christianity had an undoubted influence on the course of medical science; for the Christian was taught to recognise, in every bodily infirmity, the dispensation of the Almighty, and in the calm, abstracted pursuits of those holy men who passed their time in prayer and meditation, a propitiatory influence: hence medicine fell into the hands of monks and anchorites, who assumed to themselves, exclusively, the power of interpreting all natural phenomena as indications of the Divine will, and pretended to possess some occult and supernatural means of curing disease. These pretensions were well suited to weak heads then, just as similar charlatanism is adapted to weak understandings now; but medicine is an art of slow growth, wherein every theory, like the sturdy oak, is fed by roots which burrow firmly in the depth of time; and however true it may be that the destinies of religion and science are so closely united, that whatever promotes the one, must have a favourable influence on the other, yet the timid and absurd apprehension that free mental exercise might end in religious scepticism, has induced many a well-intentioned man to avert from science the searching eye of reason: and it is to be feared, too, that the enthusiasm and self-abnegation which religion was able to inspire in these ancient worthies, was more than counterbalanced by the private advantage which necromancy and quackery secured to their votaries; for the Essenes, of whom I have already spoken, embraced Christianity because its principles resembled their own; but it did not restrain them from disfiguring the pure and simple doctrine of their adopted faith by amalgamating with it mysterious practices for their worldly profit. They ascribed certain divine powers to certain things which they called Æons, and Christ Himself they denominated Æon, whereby they explained His miracles. They conceived that the Almighty was to be propitiated by signs and symbols, and that, as words were the direct gift of God to man, those signs which represented words were of most avail, especially words of the most ancient languages: hence arose the use of talismans, amulets or charms, on which cabalistic signs were engraved, and which, when worn round the neck, were supposed to be preservatives against all forms of disease * and evil spirits. This belief in the efficacy of charms existed long before, therefore it cannot be imputed to the Christian religion; for both Greeks and Romans suspended every kind of talisman on their bodies by means of chains, and if by chance the supernatural influence failed, the inefficacy was attributed to some disregard of the ceremony of preparation. The Jews, also, from the earliest periods, were wont to carry about with them phylacteries, or bits of parchment, with passages from the Bible written upon them. But amulets and talismans were made of metal or stone, and formed, with the strictest

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* "A talisman is a substance composed of certain cabalistic characters engraved on stone, metal, or other material, or else written on slips of paper. It differs from an amulet in this respect, that it may be deposited in any place, or carried about the person without losing its efficacy, whilst the latter requires to be constantly worn about the individual."—*Pettigrew on Superstitions connected with the History and Practice of Medicine*, page 43.

In Arabic the word "amulet" means "that which is suspended." —Page 47.

"Charms and amulets have a similar signification, and imply a similarity of power, the difference being rather in the manner in which they are severally used than in any difference of their nature. Amulets were to be suspended when employed. Charms are not necessarily subjected to such a method of application."—Page 47.

observance to certain superstitious ceremonies, at some particular period of time when an especial star was in the zenith, or when some particular planets were in conjunction. The figures which were cut on these charms varied according to the superstitions of the nations by which they were used: among the ancient Egyptians, for instance, the favourite figures were the scarabeus and ibis; they were wrought with great skill, and therefore served as ornaments as well as for protection.

During the spread of these mysterious but lucrative practices, both Jews and Pythagoreans strove to outdo the Essenes in their superstitious exorcisms, and all eventually combined to form the sects which were known as Cabalists and Gnostics, during the first century of the Christian era. Their knowledge consisted of the magic of the Persians, mixed up with the dreams of the Asclepiades, the numbers of Pythagoras, and the atoms of Democritus; in short, there was no end to their belief, provided mysticism was the basis, and magic was eventually regarded as a proper science by the Sophists of Alexandria.

The Gnostics were distinguished as the most polite and learned of the early Christians; but as in religion they blended with the faith of Christ many obscure tenets which they derived from the philosophy of the Orientals, so in medicine they launched out into the wildest speculations, and delivered themselves over to the guidance of a disordered imagination. They believed in the mysterious hierarchy of the invisible world; and were led to the doctrine of demons as the authors of all bodily infirmities. They pretended, by interrogating the evil spirits, to discover their lurking places, and by their charms and talismans to cast them out.

One figure of supreme efficacy, said to have been found in the temple at Jerusalem, and supposed by the Jews to be the symbol of the sacred name of God, was the double triangle interlaced ✡; by the aid of which both Cabalists and Gnostics performed all sorts of miraculous cures.*

Doubtless, many of the early Churchmen, foreseeing the scandal which would necessarily befall their order by the necromancy and conjuration of some of their brethren, set their faces against such absurdities, and repudiated both Cabalists and Gnostics; but it is notorious that divers of the primitive fathers, St. Anastasius amongst others, affected a power of penetrating the secrets of nature, and, by that means, of revealing the cause and issue of disease. For many centuries the priesthood engrossed the scanty knowledge of the time in their own body, and exercised the influence which it gave in impressing the laity with sentiments of superstitious awe of their divine powers. Somehow or other, there has always appeared to be a connection between the contemplation of man's relations to the unseen world, and the practice of quackery in this. Theology has ever been apt to run into superstition, and to degenerate into abuse for the sake of power. "The love of power," says Mr. Prescott, "has led the priesthood of many a faith to affect a mystery, the key to which was in their own keeping."

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* This famous diagram of the Gnostics is placed on the seal of Solomon in the "Faust" of Göethe. It is the Trutenfuss of German magicians, the symbol of freemasons, and it is the ensign of Alsatian brewers.

This is but too faithful a commentary on the first fourteen centuries of the Christian era, during which the practice of medicine was chiefly confined to monks and anchorites; and, although some few brilliant exceptions are on record, yet the sketch which will now follow of the so-called "noble art of healing," up to the fifteenth century, at least, will represent it a prey to the various opposing systems of frivolous subtleties and fanaticism, and tend to show how man became more and more credulous and superstitious, whilst the priesthood became more and more oppressive and tyrannical. Thus, the first century was most prolific of supernatural events—so much so, that the resurrection of the dead was very far from being esteemed an uncommon event, as we may collect from the Chronicles of Orderic Vital[*]; but it is a remarkable fact that few, if any, miraculous cures are recorded as having been effected by men who devoted their lives to the observation and study of natural phenomena; all were accomplished by saints or sovereigns, and to the disparagement of medical celebrities.

It is true that medicine was closely united with religion, and it is not the province of a medical writer to inquire whether the laws of nature may have been occasionally suspended for the service of the Christian Church; but miraculous cures of disease have been continued "from the first of the Fathers to the last of the Popes," and by persons who appear to have had other interests than those of religion at heart.

Both Tacitus and Suetonius relate a very remarkable instance of supernatural power practised by the Emperor Vespasian on a poor blind man at Alexandria. This latter came, earnestly entreating the Emperor to assist in curing his infirmity, alleging that he was prompted to apply by the admonition of the god Serapis, and importuning the prince to anoint his cheeks and the balls of his eyes with the royal spittle. Vespasian at first treated the supplication with disdain, but at length, moved by the fervour of the petitioner, he yielded to his desire. He did as he was requested, and success immediately followed.

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[*] Collection des Mémoires sur l'Histoire de la France, par Guizot. Orderic Vital. Tome xxv. p. 28.

Another supplicant appeared at the same time, who had lost the use of his hands, and entreated Vespasian to touch the diseased members with his foot, and he also was cured.*

Let us now turn to the black art.

To such an extent was the practice of necromancy carried, that in the time of Nero an edict of banishment was published against all magicians, but the practice lost nothing of its popularity: on the contrary, the very semblance of persecution appeared to give it increased vitality, for a spirit of rivalry was established between magicians and the priests who officiated in the temples of Æsculapius, which were still famous for miraculous cures, while both were sustained by the entire faith of the people. Credulity performed the office of faith, and thus an unresisting acquiescence in supernatural agencies characterised the first ages of Christianity. Happily, however, a few men appeared from time to time who checked, in some degree, the spread of superstition, by devoting themselves to the investigation of nature, and, as far as they were able, to the cause of truth. But they generally set out with some preconceived dogma of one or another of the sects above described, and thus perpetuated the errors which they endeavoured to correct.

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* Tacitus, Historia, lib. iv. cap. 8; Suetonius, lib. viii. cap. 7; see also Lives of the Necromancers, by William Godwin.

Nero first conferred the title of Archiater on his physician Andromachus, who obtained great notoriety from having invented a celebrated compound called Theriaca. The prescription for its preparation was translated into verse by Damocrates, and the poem is preserved in Galen's work, "De Antidotis." Soon after Andromachus had this honorary distinction conferred on him, other physicians were called archiatri (from the Greek word ἀρχίατρος, or, as rendered into Latin, *superpositus medicorum*), and were charged with a kind of superintendence over the profession generally.

Marinus was one who paid great attention to anatomy, and is said to have written a treatise on the muscles, as well as on other organs of the animal body.* He examined also the structure of the glands, and compared them to sponges for the purpose of moistening and lubricating the tissues with which he found them in contact. We read also of his disciple, Quintus, who was one of those unfortunate practitioners by whom some colouring was given to the calumny of Plato; for it is said that he was driven out of Rome because he killed all his patients.† He lived, inopportunely for him, at a period when he was called on for greater resources than he had at his command; for immediately after the eruption of Vesuvius (A.D. 79), which buried Herculaneum under a mass of ashes, a pestilential fever broke out in Rome, of which it is said that not fewer than ten thousand people died daily, during a considerable period. This malady is very generally ascribed by historians to the pollution which is supposed to have affected the air in consequence of the volcanic eruption; but it is more probable that it originated in the filth and poverty occasioned by the sudden increase made to the population of the capital, when the fugitives from the ruined towns and villages of Campania sought an asylum within its walls.* Now, when we read of the treatment then adopted for fevers, and consider the utter inefficacy of the remedies which were employed against so formidable a disease as that which was perhaps instrumental in causing the expulsion of Quintus from his native city, we are tempted to vindicate the "temerity" which Celsus admitted to be "beneficial to those whom reason had failed to cure," as well as to justify the conduct of Sir Robert Talbor, a celebrated empiric of the sixteenth century, who, on being admitted to a consultation with grave and orthodox doctors, when asked by one, "What is fever?" replied, "A disease which I cannot define, but can cure; and which you cannot cure, but can define."†

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* Portal, vol. i. p. 72.

† Ibid.

It must not be inferred from the above that the Greeks and Romans felt their deficiency in the absolute number of remedies which they possessed; for Dioscorides, who flourished in the reign of Nero, described about seven hundred medicinal plants, besides ninety minerals, and one hundred and sixty-eight animal substances*, a number far greater than that of the so-called simples contained in any pharmacopœia of the present day. It is true, he travelled over Asia Minor, Greece, Italy, and Gaul, for the purpose of collecting plants, and acquainting himself with their reputed qualities; he moreover investigated the nature of many Indian plants, which were then brought to the markets of Europe; so that he alone may have possessed much of the knowledge of the time: but he did his best to diffuse it by writing his great work, "De Materia Medica," which enjoyed a universal reputation for sixteen centuries, and was referred to during the whole of that time as the first and greatest authority either in botany or the virtues of plants. Neither is it unreasonable to suppose that the knowledge of the existence of such resources may have influenced Nero in issuing his edict for the punishment of necromancy. The lack of knowledge, however, in estimating the virtues of many substances, and the positive ignorance of many so-called specifics which we now possess, justify, we may think, the epithet which has been given to their remedies generally.

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* Encyclopædia Metropolitana, vol. x. p. 610.

† The English Remedy, or his Wonderful Secret for cureing of Agues and Feavers, by Sir Robert Talbor. 1682. This cure for agues contained bark, of which a poor Indian accidentally discovered the virtues, which the Jesuits introduced into England, and which was denounced by many at the time as the invention of the devil.

Archigenes was another celebrity of the first century. He was the earliest writer on the nature of dysentery, and suggested opium as the remedy for it; he also described with accuracy the symptoms and progress of hepatic abscess. In other respects he drew largely on his imagination, accounting for the false hope which is maintained in phthisis by representing the lungs as insensible, and fancifully describing sympathetic affections as shadows of others. His contemporary,

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* Alston (Charles), Index Medicamentorum, etc. Edin. 1752.

Aretæus of Cappadocia, was renowned for the extent of his knowledge, the soundness of his judgment, and the elegance and precision of his writing. He was the first to show the glandular nature of the kidneys, and affirmed that the terminal branches of the vena-porta in the liver were continuous with the commencing branches of the venæ-cavæ-hepaticæ—originating an error which Galen afterwards perpetuated. Aretæus was the first person who employed blisters as counter-irritants, and used the same material—the cantharis—for the purpose as that which is now employed.*

Early in the second century, Ruffus of Ephesus distinguished himself as an anatomist, and was the first to suggest that the recurrent nerve might be subservient to the voice. He also has the credit of having thus early demonstrated the investing membrane of the crystalline lens of the eye.†

But the most celebrated man of this period was Claudius Galen, or Galien, who was born at Pergamos A.D. 131. At an early age he was destined to the medical profession, in consequence of a dream which occurred to his father. He studied under the rival sectarians of Dogmatists, Empirics, Methodists, Pneumatists, and Eclectics, in the school of Alexandria, which was still in the zenith of its renown; and by the knowledge which he gained of the theories of all he acquired an insight into the failings of each, and refused to join the Empirics, on the one hand, neither was he satisfied with the views and conclusions of the more philosophical Dogmatists. He accordingly adopted a course of his own; and, for the purpose of enunciating his particular opinions, he framed an eclectical method, drawing largely on Plato and Aristotle, but availing himself also of several stoical doctrines, which at that time had gained considerable currency.*

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* Portal, vol. i. p. 62.

† Ibid. p. 74.

He travelled through Egypt, Greece, a part of Asia, and Italy, justly regarding such a course as essential to an accomplished physician. On his return to Pergamos, he was entrusted by the pontiff of that place with the wounded gladiators, whereby he gained an insight into surgery.

By long and careful study Galen acquired an immense amount of knowledge, which he directed to the purpose of bringing men back to the paths of Hippocrates, which he averred were identical with those of nature and truth; but the difficult task which he undertook was greatly increased by his desire to harmonise the doctrines of that great man with those of Plato and Aristotle. He brought on himself by so doing the accusation of inconsistency, and with some show of reason; as an instance of which, and of the effect it had on subsequent ages, I may so far anticipate my subject as to observe that the Italian surgeons in the thirteenth century, being divided in their opinions concerning the treatment of wounds, appealed to the teaching of Galen. One sect finding in his writings that "moisture and relaxation of tissues are more natural than dryness and tension," treated their wounds with moist applications; whilst their opponents, finding in another part of the same author, that "dryness approaches more nearly to the natural state than moisture," employed desiccating remedies: so that both parties appealed to Galen as their authority, and found reasons for two diametrically opposite systems of treatment. On the whole, however, he did good service to medicine; and in nothing more so than in collecting and transmitting the works of Hippocrates as a text-book for many subsequent generations. He devoted himself to the investigation of organic nature, and diligently pursued the inquiry relative to the indications of design in the structure of the animal body. In these researches he adopted the teleological views of Plato and Aristotle, without, however, blindly following either; for his independent observations led him to peculiar conclusions, whereupon he wrote original essays: and thus he treated of every subject connected with medicine except chemistry. He sets out, however, in each particular instance with the foregone conclusion that the animal body is composed of the four elements, and in all his precepts his great object is to promote or restore the due and normal mixture to all the parts.

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* Ritter, vol. iv. p. 251.

For thirteen centuries his system reigned supreme in Europe, Asia and Africa. Like Hippocrates, he was greatly in advance of his time, and, like him too, he regarded anatomy as the basis of medicine, although he derived his knowledge of anatomy chiefly from the dissection of the lower animals.*

His osteology was very perfect and very correct. He distinguished and named the bones and sutures of the cranium, nearly as they are known at the present time. He gave the first clear account of the vertebræ, and their division into cervical, dorsal, and lumbar; distinguishing these latter from the os-sacrum and os-coccygis. He also described the ribs, sternum, and pelvis, as well as the bones of the extremities and their articulations.*

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* Portal, tom. i. p. 77.

It is very evident that he was conversant with most of the muscles, which he defined as fleshy and tendinous parts, destined to execute the voluntary movements†, and very far surpassed his predecessors in these investigations. The abdomen and thorax he represented as separated by the diaphragm, and the viscera contained in these cavities of the body as covered with the peritoneum and pleura. The alimentary canal he subdivided into the following parts—viz. gula, œsophagus, stomachus, jejunum or intestinum tenue, cœcum, colon, and rectum; and assigned to the veins distributed throughout the intestines, the function of imbibing the fluid nutriment, and of conveying it, by means of the vena-porta, to the liver; where he supposed that the process of sanguification, or the formation of blood, took place. He then traced the blood, through the venæ-cavæ-hepaticæ, to the right auricle or sinus of the heart. These venæ-cavæ-hepaticæ he regarded as the starting-point of the venous system from the liver.‡

But the most interesting part of all the works of Galen is that which pertains to the heart, and the vessels proceeding therefrom; for the result of his investigations constitutes a link in the chain of events which led to the discovery of the circulation of the blood.§

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* Galen, De Usu Partium, lib. i. cap. 1—12; Epitome, by Theophilus Protospatarius, 18mo. Paris, 1540.

† Ibid. lib. ii. cap. 2—6; and Portal, vol. i. p. 89.

‡ Galen, De Usu Partium, lib. ii. cap. 7.

§ Flourens, Histoire de la Découverte de la Circulation du Sang, pp. 7, 8.

The heart itself he described as a hard fleshy organ, of a conical figure, containing two cavities or ventricles —a right and a left—the right being, as he supposed, the receptacle of blood, with a little spirit; the left, the source of spirit, but containing also blood.* He moreover dedicated a chapter to the vessels proceeding from the heart, wherein he represented the venæ-cavæ and pulmonary artery as being, for the purpose of conveying the blood to the grosser organs and the body generally; and the pulmonary vein and aorta as set apart for the distribution of a more spiritual blood to the lungs, brain, &c.† But we have seen that Erasistratus believed the air which entered the lungs, through the trachea, was conveyed by the pulmonary veins to the left ventricle of the heart; and thence, by the aorta and its ramifications, to every part of the body; the question, therefore, naturally suggested itself to his followers, "If the arteries contain blood, how can they transmit the air which passes from the lungs into the left ventricle?" Galen simply replied, "It does not so pass."‡ This attribution of the true character of arteries was the removal of one great stumbling-block which lay in the path to the discovery of the circulation of the blood. In assuming the difference between arterial and venous blood, he supposed that the arteries carried a purer blood to the more refined and delicate organs, such as the brain and lungs, whilst the veins conveyed blood of an inferior quality to the more gross and solid organs, such as the liver and spleen.§

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* "Sanguinis quidem receptaculum dexter est, paucum spiritum continens; at spiritûs fons est sinister, modicum sanguinis habens, quando quidem et arteriæ affluentes."—*Protospatarius*, lib. iii. cap. 9.

† Theophilus Protospatarius, lib. iii. cap. 9.

‡ Flourens, Hist. p. 4.

§ Ibid. pp. 7, 8.

He affirmed, however, that the venous blood was not equal to the duties assigned to it, unless some portion of the essence or spirit contained in the left ventricle and arterial blood was infused into it; and the question was, how this infusion could be effected? He solved the difficulty by framing a theory which was as great an impediment to the discovery of the circulation as that which he had removed. He affirmed that the two ventricles of the heart communicated by holes through the septum, or partition, which divides them. His theory required for its confirmation the fact of the holes; and holes were seen, not only by himself, but by Le Vasseur, Mundinus, Bérenger, and others, although no such holes existed. Yet, so paramount was the opinion of Galen, that no one presumed to question what he had asserted; and the error was accordingly perpetuated until Vesalius, in the sixteenth century, dared to say that no such holes appeared.

The theory of respiration which Galen propounded was perfectly consistent with the rest of his physiology. The heart, according to his belief, was the source of an essence, or vital spirit: he did not, therefore, stand in need of the influence which *we* know is communicated to the blood by the oxygen of the atmosphere, and could afford to attribute to the air the less important use of cooling the blood by its temperature alone.* His conclusion was the reverse of truth; but, in adopting it, he abolished the erroneous doctrine of Erasistratus relative to the function of the arteries, and prepared the way for the chemical theory which was destined to destroy his own, and to initiate the idea of the very antithesis in its place. He entertained, however, a very correct notion of the importance of respiration for the purpose of speech; and his remarks thereon would not disgrace a physiologist of the present day.*

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* Flourens, Hist. p. 5.

His acquaintance with the nervous centres and their functions was most limited; yet, when we contemplate the amount of it, and compare it with what we know, even at the present day, how impressively are we admonished that it is unseemly to smile at his ignorance, seeing how little of it has been dispelled during a period of seventeen centuries. The notions which he entertained of the brain and spinal-cord were extremely vague, although, like Erasistratus, he surmised the existence of nerves of sensation, and nerves of motion: he considered, too, that the cerebrum was the source of them.†

He recognised seven pairs of nerves originating from the brain: the first he named the optic ‡; although, if we may depend on the accuracy of the epitome which Protospatarius has given of his works, he was also acquainted with the olfactory nerves.§

He gave the names to the corpus callosum, the septum lucidum, the fornix, and the corpora quadrigemina in the brain, and described the nerves of the spine as passing out in pairs—one on each side.*

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* Speaking of the thorax, Galen says, "Hoc autem sinu piscibus quidem cor solum continetur; ob eamque causam genus ipsorum universum sine voce est, quod uno instrumentorum, quæ ad vocis generationem sunt necessaria, pulmone videlicet careat: nam omnibus, quæ ex aëre inspirant, animantibus, ac rursus in ipsum expirant, pulmo per os implevit thoracis cavitatem, ut qui vocis simul ac respirationis instrumentum extitit." — *Kühn's Galen*, vol. iii. p. 411.

† Protospatarius, lib. iv. cap. 5 and 8, De Cerebri naturâ, etc.

‡ Portal's Hist. tom. i. p. 88.

§ Protospatarius, lib. iv. cap. 11, De Nasi foraminibus, etc.

The end which he proposed to himself was, to found a perfect system of medical science by the application of certain logical rules and ideas, derived from the older philosophy, upon the basis of his own experience, and a few traditional principles of the school of Hippocrates.† Accordingly he expressed himself strongly on the superiority of theory to mere empiricism, but wisely abstained from the vague speculations of most of his contemporaries.

He recognised an external, or accidental, and an internal or predisposing cause of disease, and endeavoured to found his system of treatment thereon; so that, in truth, medicine in his hands, as in those of Hippocrates, was a science which, more than any other, anticipated the Baconian philosophy—for it was based on an induction proceeding by select experience, always observant, always cautious, and ascending slowly to the generalities of theory.‡

The great duty of the physician he described to be that of maintaining the different parts of the human body in their healthy condition, and of re-establishing their healthy functions when diseased. His theory of the action of medicines prevailed so long, and was accepted by so many nations, that a brief exposition of it may not be uninteresting. He assumed that the difference in the actions of medicines arose from each one being, to a certain degree, either hot or cold, or dry or moist, or consisting of minute or gross particles. In each of these qualities he recognised four degrees, or orders: one being imperceptible to the senses, and only to be inferred from reflection; the second being perceptible to the senses; the third being strongly heating, or cooling, or desiccating, or humectating; and the fourth so strong as to destroy the tissues of the body to which it might be applied. His descriptions of particular substances, and his detailed account of their properties, are mostly borrowed from Dioscorides.

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* Portal's Hist. tom. i. p. 88.

† Ritter, vol. iv. p. 250.

‡ Hallam's Introduction to the Literature of Europe in the 15th, 16th, and 17th Centuries, vol. i. p. 465.

In his treatise "De Usu Partium," he attempts to prove from the framework of the human body, the wisdom, power, and goodness of the Creator, in opposition to the philosophy of Epicurus which then prevailed. A great portion of the system of medicine which he compiled at Rome, under the patronage of Marcus Aurelius and Lucius Verus, is said to have been destroyed by the burning of the Temple of Peace, wherein his manuscripts were kept.

Between Hippocrates and Galen there is this difference: the works of the first consist chiefly of facts observed by himself or others; whereas those of the latter contain much reasoning and many hypotheses, which have furnished more matter of dispute than have the writings of Hippocrates. Galen's system was ingenious; and when he illustrates any part of Hippocrates we are indebted to his sagacity and industry; but when he discourses concerning faculties, spirits, and occult causes, although he reasons well from precarious and sometimes false principles, he leaves us in the dark.*

That Galen was a most sagacious as well as learned man there can be no doubt; but his success, together with his extreme vanity and arrogance, brought on him the envy and hatred of his professional brethren, whose treatment induced him to leave Rome, where he had established himself, at the age of thirty-four. The brilliant reputation, however, which he had acquired, incited the Emperor Aurelius to recall him to the "city of the world," and he continued there during the remaining period of his life.

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* Encyclopædia Metropolitana.

Living, as he did, in an age of charlatanism, he could not be expected to be quite free from its influence; and it is reported of him that he had a superstitious veneration for dreams, of which he professed to have many from Æsculapius himself, whereby he boasted that he was infallible in some subjects, as, for instance, in the prognosis of disease. He practised, too, the means by which many physicians of his day conciliated the favour of the public; namely, the preparation of cosmetics for the preservation of the beauty of the skin, the plumpness of the form, and the growth of the hair. It was the custom of the physicians to accumulate and preserve nostrums, which practice Galen adopted to its fullest extent, and often paid enormous prices for some of them. Notwithstanding all his failings, and even the cowardice of which he was accused in running away from the plague, with which he was subsequently attacked, Galen was, as Dr. Bostock has described him, "one of those extraordinary men who are destined to form an era in science, both from the actual improvements which they have introduced into it as well as from the ascendency which their genius enabled them to acquire over the minds of their contemporaries." *

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* Cyclopædia of Practical Medicine; "History of Medicine," by Dr. Bostock, vol. i. p. 26.

Galen was esteemed by many during his life and venerated after his death.

Soranus of Ephesus, whom we have before noticed, was a contemporary of Galen. He was educated at Alexandria, from which place, during the reign of Trajan, he migrated to Rome, where he taught and practised medicine with great success, and raised the sect of the Methodici to its highest degree of reputation. He devoted much time and attention to the structure and function of those organs which are subservient to the perpetuation of the species—a subject of investigation, which, as it affords an unbounded scope for hypotheses, has evidently been a favourite topic with all ancient anatomists; for there is scarcely one of any note, from Pythagoras onward, who has not written concerning it. In his time the leprosy, which, as we have seen, Pompey brought from the East into Italy, was making the greatest ravages; and the physicians, who were not well acquainted with the disease, suggested various preparations against each of its particular symptoms. Some of those employed by Soranus have been preserved to us by Galen.* To Soranus also are we indebted for the first observations upon that curious parasitic worm known as the Guinea-worm (*Filaria Medinensis*) which abounds in Abyssinia, Egypt, Arabia and Guinea.† His opinion on the absurdity of magical songs and incantations, which were then frequently practised in the treatment of diseases, shows how little he was imbued with the prejudices of his age.

Cælius Aurelianus is supposed to have lived shortly after Soranus, but the precise time is uncertain: as neither he nor Galen mentions each other, it has been supposed that they were contemporaries. He described the system of the Methodici in a more perfect and comprehensive manner than any other writer; so that without his work we should not have any correct knowledge of the sect.* Cælius Aurelianus appears to have been an observant practitioner, for he gives several well-recorded and original cases both in medicine and surgery; he also translated the works of Soranus into Latin.

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* De Compositione Medicam. lib. i. cap. 2, 8.

† Paulus Ægineta, De Re Medicâ, lib. iv. cap. 59.

According to the researches of Webster, epidemic diseases were of frequent occurrence during the first two centuries of the Christian era; and so many convulsions of nature happened at the same time, that he has referred to the period as an illustration of his theory, that in all great plagues the epidemic principle extends to different countries and coexists with great natural phenomena.† It generally happened, however, that the Tiber overflowed its banks, so that the surrounding country was saturated with water before the disorders appeared in Rome:‡ hence it is more than probable that if good drainage and cleanliness had been appreciated and practised, the cataclysmal theory of Webster would never have been framed.§ If it be permissible to animadvert on these subjects, with the imperfect data which we possess, we should be disposed to conclude, that the great and exceptional men above referred to, were not in possession of such resources as were required to meet the frequent recurrence of pestilential visitations; and that, notwithstanding the stimulus to exertion which the continuance of these scourges ought naturally to give birth to, the death of Galen may be regarded as the epoch when anatomical research and the healing art began to fail.

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* The best edition of "Cælius Aurelianus" is that of T. Jansen ab Almeloveen. Amsterdam, 1722 and 1755.

† Webster's History of Epidemic Diseases, vol. i. p. 108.

‡ C. Cornelii Taciti Annalium, lib. xvi. cap. 13.

§ The above seems to require some qualification, for the Cloaca Maxima shows that the city was drained; but where rivers like the Po and Tiber overflow a campagna almost level, fetid evaporations necessarily take place, and produce remittent fevers, etc.

In the second century a total separation of the sick from the healthy was proposed, in order to check the spreading of leprosy. But the recommendation was opposed by the public, and physicians were blamed for proposing such harsh measures. There was, however, a greater disregard of human life then, than now exists, as every page of early history shows; and it appears to have been rather from carelessness than sentiment that the ancients objected to the measure. Where their interests lay they were careful enough; for they made a general practice of arresting the progress of murrains among their cattle, by a separation of the diseased from the healthy.

When Eusebius, Bishop of Cæsarea, who was one of the most distinguished of the early Christian chroniclers, undertook to write the history of the first three centuries of the Christian era, he confessed, at the very outset of his narrative, that he was entering on a desert and untrodden road. He had acquired so great a reputation for learning that it was said of him that he was acquainted with all that had been written before him. Seeing, then, that he compiled his Universal History* early in the fourth century, when living amongst the very people whose immediate antecedents and customs he was about to narrate, how faint should be our assurance of many circumstances connected with the period when he himself started with such a declaration! There are some things, however, in which no uncertainty exists: but, unfortunately, they testify to the perversion of natural knowledge which very generally characterised the early Christian ages; and, although many interesting details may be lost to us, yet is there little or no discrepancy of opinion relative to the influence which so universally prevailed. The noble art of healing, which acknowledges no other divinity but nature, and no other code of laws but that which governs and regulates the animal organism, fell into decay when brought into contact with the senseless infatuation of the Cabalists, but manifested some flickering symptoms of revival under the masterly hands of Galen, and again yielded to the darkness of superstition, and a slavish acquiescence in the most insensate pretensions which ever held the human mind in thraldom. It was another proof, if one were wanted, added to those recorded in all history, that a good cause has no exemption from the changes and chances of fortune; but it is painful to reflect that those evils have, for the most part, been inflicted by individuals possessing the greatest amount of intellectual culture, though often, perhaps, the least amount of common sense. There are noble exceptions to the rule; but it is true, as we shall produce abundant evidence to show, that the delusions which have from time to time obstructed the course of improvement in medicine, have generally been nurtured by those whose early education should have developed the faculty of learning virtue from experience. The fact, however, still exists, and brings down to the nineteenth century the traditions of the early and middle ages.

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* The "Chronicle, or Universal History," was known only by fragments until it was discovered early in the nineteenth century in an Armenian manuscript version found at Constantinople, and published by Zohrab and Mai at Milan in 1818.

Whenever an extravagant instance of fanaticism comes out in the annals of the history of these latter periods, we may be tolerably certain that it reveals a continuous current of superstition and credulity, which gave a ready acceptance to the pretensions of the most impudent charlatan; and if any man boasted of supernatural power he was the more certain of success. A curious instance of this is recorded in the biography of Apollonius, who was reputed to be in immediate communication with Heaven. The body of a young lady of beautiful person, laid out upon a bier, was being conveyed to the tomb; she was followed by a multitude of weeping friends, amongst others a youth to whom she had been affianced. Apollonius met the procession, commanded the bearers to set down the bier, exhorted the proposed bridegroom to dry up his tears, and enquired the name of the deceased; saluting her accordingly, he took hold of her hand and murmured over her certain mystical words, whereupon the maiden raised herself on her seat, and presently returned home to the house of her father.* By way of sustaining the fraud, but assigning the luxurious habits of the citizens of Tarsus, wherein he dwelt, as a pretext, he retired to one of the temples of Æsculapius, where he imposed on himself all the restraints of the most austere Pythagorean, and by his staid demeanour, together with his usual gasconade, he acquired the character of philosopher amongst sages, and of magician amongst the laity. After his death the inhabitants of

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* Philostratus, lib. iv. cap. 45. See also "Lives of the Necromancers," by William Godwin.

Tyana erected a temple wherein he received divine honours.* In spite of the edict of Nero, which has been referred to, most of the Roman Emperors favoured magic, and permitted the practice of it amongst their subjects. Hadrian, for instance, like Vespasian before him, was reputed to have restored sight to a blind man by simply touching him with his hands. Titus, Aurelius, and Severus, were all devoted to magic.† Cavacalla had a marked contempt for all kinds of learning, as well as for men of letters. The peaceful pursuit of the student, and the abstract researches of the philosopher were regarded by him as an avowed dereliction of manhood. This opposition to learning generally was adverse to the cause of necromancy; but it continued to find many advocates among the clergy, whose desire of secular advantages absorbed all spiritual concern.

It is recorded of Diocletian that, for the purpose of destroying the universal belief in supernatural power, he interdicted the practice of it (A. D. 296) together with the use of the sacred books of the Christians, as well as of all ancient books which treated of the art of making gold and silver. It has been suggested, however, that these latter books, which were then ascribed to Pythagoras, Solomon, and Hermes, were probably the pious fraud of more recent adepts; for Pliny, who recorded all the arts and errors of mankind, makes no mention of the transmutation of metals. But the Emperor was not proof against the weakness of the age; for, in his anxiety to pry into futurity, he consulted both soothsayers and oracles, which returned answers adverse to the Christians.

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* Biographie Universelle, art. "Apollonius."

† Encyclopædia Metropolitana.

The check which was given to the peculiar quackery of the age by the imperial ordinance of Diocletian, was strengthened by the Emperor Constantine, who had a great respect for orthodox physicians. He subdivided them into two great classes, for the purpose of insuring a better performance of their respective duties, although they had been separated before into two sections by Antoninus Pius, and named respectively the Archiatri of the palace and the Archiatri of cities (Archiatri Palatini and Archiatri Populares). The Archiatri of the court were selected by the Emperor to form a corporation, to which the exemption from public burdens, as granted by Augustus, was confirmed; certain rights and privileges were bestowed, and the distinction of rank accorded, which became more important during the reigns of the later Emperors, when strict rules of precedency were established. The Count of the Archiatri was a "vir spectabilis," equal in rank to the dukes and vicars of the Emperor.*

The Archiatri Populares were elected by the citizens and approved by the Archiatri Palatini. Five resided in every small town, seven in larger, and ten in the largest. In Rome fourteen were appointed for the different districts of the city, one for the vestal virgins, and one for the gymnasia. They also were exempt from the payment of taxes and public burdens, besides which, they derived from the towns a remuneration in kind (annonaria commoda), as well as a salary from the state, for which they undertook to treat the poor gratuitously; but for treating other patients, they were authorised to take fees, like their professional brethren. They formed medical committees, or a college in each city, and superintended the public health as well as the medical profession generally. They also taught medicine, as we may infer from a decree of Constantine, which states, "We order rewards and salaries to be given to them, that they may the more readily imbue many pupils with liberal studies, and the said art." Thus:

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* Penny Cyclopædia, art. "Archiater."

> "Learning and Rome alike in empire grew,
> And arts still follow'd where the eagles flew."

The Archiatri did not comprise all the practitioners of medicine, for the exemption of all from the payment of taxes, &c., was found to be too extensive a privilege. Were it possible to represent to the mind's eye the precise condition of the entire class at this particular period, in all probability an orthodox and ingenuous minority would appear, intent only on achieving an efficient and perfect system of practice, pursuing their sacred calling for the good of all in the midst of a crowd of subordinate and superstitious operatives, of whom the greater part were monks and ecclesiastics, as we may learn from the melancholy picture which Cyprian and Origen have drawn of the time; or, worse still, of ignorant pretenders who trafficked on the credulity of their fellow-creatures by magic, and other delusive frauds, to the utter disregard of common sense, and of the rules deduced from the experience of the ancients. It was, in short, an age of miracles and prodigies, when sorcerers vied with saints in their pretensions to supernatural power; and the popularity of the illusions precipitated the downfall of the Alexandrian school, which was still regarded as the focus of all learning. That school felt and reflected the influence of the transitional state of that mighty power which, for 700 years, overshadowed the earth with its universal dominion; and when history comes to be made a faithful exponent of the medical profession as it then existed, we find it rapidly degraded to a vacillating compromise, wherein the views of the old sectarians are jumbled together as in a kaleidoscope, to form a dogmatico-empirical school, combined with the tenets of the Methodists and Eclectics. Eventually it is dwarfed to the narrow compass of a mere biographical sketch of a few individuals, whose names, with one or two exceptions, are worthy of record more in consequence of their conservative virtues than of any advance they made in knowledge; whilst the western world, generally, sunk back, as by one common consent, into that benighted ignorance which characterised the succeeding centuries, so justly called the dark ages.

The first exceptional name is that of Oribasius, of Pergamos, a celebrity of the fourth century. He was a friend and confidant of Julian the Apostate, who commanded him to compose a summary of all that had been previously written on medicine. The result was an epitome, which he dedicated to his patron, wherein he drew so largely on Galen that he has been called Galen's Ape. It is but fair to state, however, that in the preface of his work, of which only seventeen out of seventy books have been transmitted to us, he professes to attach more importance to Galen than to any other medical authority; notwithstanding which he interprets the ideas of Hippocrates with fidelity and truth, as well as with great order and precision.[*]

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[*] Oribasius entitled his great work "Collecta Medicinalia" (*συναγώγαι ἰατρικαὶ*), which was first published in Latin about 1550. Venet., edited by J. Bapt. Rasarius.

He also wrote an abstract of the above work, in nineteen books, the whole of which we possess at the present day. This he dedicated to his friend Eunapius, who wrote an account of his life.

He moreover composed a description of the mode of preparing remedies, which he compiled chiefly from Dioscorides; and gave an account of a strange distemper, which he regarded as a kind of melancholia. "The affected," says he, "go out of their houses in the night time, and in everything imitate wolves, and wander about the sepulchres of the dead till daybreak. You may know them by their symptoms. Their looks are pale; their eyes heavy, hollow, dry, without the least moisture of a tear; their tongue exceedingly parched and dry; no saliva in the mouth; extreme thirst; their legs, from the falls and bruises they receive, are full of incurable sores."

So talented was he, that there are in the Greek Anthology two epigrams written in honour of him; and it is surprising that he should have confined himself to the office of a mere compiler, seeing that his works contain some original observations, such, for instance, as the first description of the drum of the ear (membrana tympani) and of the salivary glands, which were not noticed by Galen.

But in spite of all this, a letter from Julian to Oribasius is said to exist, showing how deeply both were tainted by the prevailing superstition. On the death of the emperor, Oribasius fell into disgrace through the envy of his enemies; all his estate was confiscated, and he was banished by Valentinian and Valens. He supported his misfortunes with fortitude, and by his medical talents gained so much love and reverence that the barbarians (as they were called) began almost to adore him as a god. At last the emperors, feeling their loss of his professional skill, recalled him from banishment, restored his confiscated fortune, and loaded him with honours.*

About the same time lived another remarkable man, Nemesius, Bishop of Emesa, in Syria, to whom the enemies of Harvey (Bishop Fell amongst the rest) ascribed the first description of the circulation of the blood. In his treatise entitled "De Natura Hominis," this curious passage occurs:—"The motion of the pulse takes its rise from the heart, and chiefly from the left ventricle of it. The artery is with great vehemence dilated and contracted by a sort of constant harmony and order." So far, certainly, he may be said to have described a portion of the circulation and a phenomenon connected therewith accurately; but in the following part of the passage he as signally fails to follow the course of the blood into the veins; for, says he, "while it (the artery) is dilated, it draws with force the thinner parts of the blood from the next veins, the exhalation or vapour of which blood is made the aliment for the vital spirit. But while it is contracted it exhales whatever fumes it has through the whole body, and by secret passages, as the heart throws out whatever is fuliginous through the mouth and nose by expiration." Now, in this concluding part of the passage, he may be understood to mean that the artery, in dilating, draws the *blood*, by the intervention of the heart, from the venous system; and even this is a too liberal admission; for he says "the *thinner* parts of the blood from the *next* veins," but he is altogether silent on the circulation of the blood through the lungs, and thence to the heart, which was undoubtedly first described in the sixteenth century."

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* Penny Cyclopædia, art. "Oribasius."

Meletius is referred by Portal[*] to the fourth century. He wrote chiefly on physiology; but before speculating on the function of a part he gave an anatomical description of the organ concerning which he was about to treat.[†]

The knowledge of the time was almost wholly confined to the ecclesiastical orders, and amongst them instances of the grossest ignorance were very common; for many of them could neither read nor write. Immersed in the pursuit of the marvellous, proud of their prejudices, and happy in ignoring the responsibility attached to the healing art, all were content with things as they found them, and little disposed to bestir themselves for anything better. The prevalence of magic, and the reign of all ancient superstitions, resumed their importance, and came to be regarded with so much alarm, that tribunals were erected, both at Antioch and Rome, to punish all who were even accused of exercising or conniving at such dark and mysterious crimes. The practice harmonised so well with the taste of the age, that the prisons were crowded with innocent people, of all ages and both sexes, who were supposed to be addicted to divination.[‡] These persecutions, however, were instituted against political necromancy, which grew out of the spells and incantations exercised against evil spirits and diseases. One Jamblicus of Chalcis, a disciple of Porphyry, pretended, by certain forms and ceremonies, to call down and command the assistance of supernatural beings* ; but, like most of the craft, his character seems more liable to the charge of studied imposture than of overheated fanaticism.

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[*] Portal, vol. i. p. 114.

[†] De Natura et Structura Hominis. Opus e Græco in Latinum versus à Nicolao Petreio Corcyreo. Venet. 1552.

[‡] Zosimus, lib. iv.

Although the clergy were so given to the black art, to the monastic establishments alone are we indebted for the preservation of all the ancient authors which have escaped the blind fury of Gothic ignorance. Moreover, as Mr. Hallam has observed, " the necessity of preserving the Latin language, in which the Scriptures, the canons, and other authorities of the Church and the regular liturgies were written, and in which alone the correspondence of their well-organised hierarchy could be conducted, kept flowing in the worst seasons, a slender but living stream."† And there was more difficulty even in this than we are aware of; for the Christians were forbidden the use of the best classical writers by Julian, on the plea that, as they rejected the heathen gods, they ought not to avail themselves of the learning and genius of those who believed in them. In this respect, then, the introduction of Christianity had a beneficial influence : for it prevented the total extinction of learning, and the loss of many manuscripts which the monks have transmitted to our times, whereby the classical languages have been restored to their original purity. But it did something more, as we may readily collect from the address of Demetrius of Ephesus to his fellow-craftsmen in the making of charms‡; it counteracted also the bloody idolatry of the Celts, and tended to soften the ferocity and humanise the feelings of the times.

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* Mysteries of the Egyptians, &c. by T. Gale. Oxford, 1678.

† Hallam's Literature of the Middle Ages, vol. i. chap. i. sec. 4.

‡ See Acts of the Apostles, chap. xix.

In the fifth century both Rome and Constantinople could still boast of medical schools worthy of the first two cities of the civilised world; but the incursion of the Goths, whose infancy was cradled in the dark forests of Scandinavia, and whose mighty nations spread their victorious swarms over the greatest portion of the Roman world, had a marked influence on the decadence of medicine as well as of general literature; for the only class of citizens likely to advance knowledge by independent research, was that which most nearly approached in its character the middle classes of the present day—the Curiæ, or wards—who were so oppressed with taxes and imposts that, notwithstanding all the vicissitudes and confusion to which they were exposed by the successive invasions of Belisarius, the Lombards, and the Saracens, they hailed with joy the advent of the barbarians, for it gave them the opportunity of withdrawing from their ordinary vocations, and amalgamating themselves with the priesthood into monastic institutions, where their private lives became so corrupt and dissolute, their covetousness and rapacity so unbounded, their ambition and tyranny so worldly and despotic, their hypocrisies and impostures so manifold, and their ignorance and superstition so extreme, that the sacred behests of Christianity were constantly violated, and the pursuit of knowledge gave way to every perversion of truth.

> "With tyranny then superstition joined;
> As that the body, this enslaved the mind."

To such influences and to the slavish subordination of the people to the will of their superiors, must be attributed the advent and perpetuation of the dark age, during which, as Gibbon has observed[*], "it would be difficult, within the same historical space, to find more vice and less virtue." The moral and intellectual character of the laity could not attain a high standard when that of their teachers was so low; but in spite of the abuse of power and errors in practice which the monks connived at and exercised for the gratification of their own wicked and selfish purposes, it should never be forgotten that to them is due the first establishment of Hospitals. With all their superstition and contempt for learning, some few of them endeavoured to alleviate the sufferings of the sick poor; and even, as has been suggested, if this act of paternal care originated in a sordid motive, the result has been preeminently beneficial. One of the first of these houses for the reception of the poor, if not the very first, was built at Rome by Fabiola, a Roman lady, the friend of St. Jerome, consequently in the fifth century. As public receptacles, they were originally instituted for the alleviation of sickness exclusively, and not for the purpose of serving as medical schools.[†]

With the first siege of Rome in 408, the unfortunate citizens were reduced to the distress of scarcity of food, and, at length, to the horrors of famine. According to Gibbon, "the most repugnant food, either to sense or imagination, and aliments the most unwholesome and pernicious to the constitution, were eagerly devoured, and finally disputed, by the rage of hunger. A dark suspicion was entertained that some wretches fed on the bodies of their fellow-creatures, whom they had secretly murdered; and even mothers are said to have tasted the flesh of their slaughtered infants. Many thousands of the inhabitants of Rome expired in their houses, or in the streets, for want of sustenance; and as the public sepulchres without the walls were in the power of the enemy, the stench which arose from so many putrid and unburied carcasses infected the air; and the miseries of famine were succeeded and aggravated by the contagion of a pestilential disease.

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[*] Decline and Fall of the Roman Empire, vol. vi. p. 340.

[†] Beckmann's History of Discoveries and Inventions, art. "Infirmaries and Hospitals."

When these calamities subsided all liberal studies had come to an end, and from this time forth until the eleventh century ignorance and superstition reigned supreme. Medicine shared the fate of all other branches of human knowledge, although perhaps not to quite so great a degree, as it had but the one heresy of magic to contend against, whilst religion was exposed to more numerous points of attack.

In this state of things the Jews, who were hated and persecuted, acquired legitimate influence by the medical knowledge which they obtained in their course of trafficking with the Orientals, from whom they brought drugs, and thus played an important part in the history of medicine. The fate of learning was less deplorable among the Greeks and Orientals than in the western nations; and long before the Vesigothic conquests the Jews had settled in great numbers, especially in Spain.* But the polar star during this mediæval night, to whom Aëtius in the fifth century, as well as Alexander and Paulus in the sixth, looked for their guidance, was Galen, whom they followed devoutly. Aëtius, a famous physician, born at Amida in Mesopotamia, compiled all the medical knowledge of

* Encyclopædia Metropolitana.

his predecessors, more particularly of Galen, in a work entitled Tetrabiblos, in sixteen books. He describes therein, for the first time, some few diseases of the eyes; but the work is professedly nothing more than an account of the practice of physic and surgery of earlier writers. We learn from it that the actual cautery was extensively used in his day, particularly in palsy. He quotes Archigenes, who says, "I should not at all hesitate to make an eschar in the nape of the neck, where the spinal marrow takes its rise, two on each side of it," &c.; "and if the ulcers continue running a good while, I should not doubt of a perfect recovery." This passage has additional interest from the fact that a comparatively modern surgeon (Mr. Pott) revived this practice in palsy of the lower limbs, applying the actual cautery on each side of the spine, a little above the sacrum; and in some cases with so much success, that it seems wonderful the use of it is not continued in that and other intractable diseases.

Aëtius is, moreover, the earliest writer who ascribed medical efficacy to the external use of the magnet; but this also he does upon report, and not upon his own experience. "Tradunt" (says he) "magnetem detentum manu chiragrorum ac podagrorum dolores ipsorum sedare: æque convulsis opitulatur." (They say that those who are afflicted with gout in their hands or feet, or with convulsions, are relieved by holding a magnet in their hands). His account of Galen's principles of the Materia Medica is particularly comprehensive; and is calculated to convey a more distinct idea of the system than the more lengthy exposition of it by Galen himself; he shows, too, that the Greeks were well provided with vegetable medicines. But his great care was to enumerate all the pretended specifics, charms, talismans, and amulets, which were held in high repute.*

In the works of Aëtius we have a perfect representation of the period before and during which he lived; and it is impossible to read them without discerning the real source of all the deception and artifice which, for so long a time, kept in subjection the faint glimmering of reason and truth.

However strong may be the disposition to idealise and approve of past events, a careful study of Aëtius can do no other than dispel the illusion, if any such be indulged in, as far as that particular epoch is concerned; for the colours in which he paints the delusions of the age, are calculated to reconcile the most determined Cynic to existing circumstances.

Unlike the ancient Greeks, the Christians had been taught to regard the soul and body as of unequal value, for immortality had been made to the latter a great and recognised fact; but it had not the effect of restraining them from practices which, with certain predilections in favour of conscientiousness, we are disposed to regard as constituting the lowest depths of human degradation.

Those of them who professed to cure disease, contributed abundantly to propagate the mischief which impotence is so prone to; and what so congenial with such natures as the perversion of truth and common sense? Accordingly, we find them intensifying the one great curse from which medicine has ever been the sufferer. From the highest and wildest fanaticism, to the lowest and most astute fraud, every sort of imposition was practised; and in the writings of Alexander Trallianus, of whom we shall have to speak immediately, we have something like a reason given why learned men were induced to give a negative sanction to these doings, if such a term be permissible, just as any one who demurs to be thought illiberal, is disposed to do towards the thousand forms which quackery assumes at the present time.

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* The works of Aëtius were translated into Latin by Janus Cornarius, a physician of Frankfort, and published at Basle in 1542.

As an instance of the most lofty pretension, we read of Proclus, the last rector of the Neo-Platonic school at Athens, "whose life," says Gibbon, "with that of his scholar Isidore, composed by two of their most learned disciples, exhibits a deplorable picture of the second childhood of human reason." According to his successor and biographer, Marinus, by long fasting and constant prayer for immediate intercourse with the Divine Being, he possessed the supernatural power of expelling all diseases.*

Monastics in all ages have required, for want of more healthy occupation, some object of veneration, and they have made for themselves idols in the shape of popular saints; but how far the miracles attributed to these saints were the result of honest fanaticism, and how far of deception, it is impossible to say. The result, however, was, that men generally acquired a rooted habit of demanding overt and immediate signs of the favour of God on all occasions of life. Hence the Latin Church has either a saint, a relic, or a charm, for almost every disease. St. Apollonia has been invoked against toothache; St. Avertin against lunacy; St. Benedict against stone; St. Clara in sore eyes; St. Herbert in hydrophobia; St. John in epilepsy; St. Maur in gout; St. Pernel in agues; St. Geneviève in fevers; St. Sebastian in plague. In affections of the head generally, St. Ottila was prayed to; in those of the neck, St. Blazius; in diseases of the body, St. Lawrence and St. Erasmus; and in those of the legs and feet, St. Rochus and St. John. St. Margaret was supplicated for children, as well as in parturient danger; and a long list of others may be found in Mr. Pettigrew's work on Superstition (page 37). In Brand's "Observations on Popular Antiquities" * many others may be read of.

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* Works of Marinus, published by Fabricius. Hamburg, 1700.

"Amulets were approved by Renodeus, Platanus, and others. Bassardus Viscontinus commends Hypericon, or St. John's wort, gathered on a Friday, in the hour of Jupiter (that is, about the full moon in July) when it comes to its effectual operation. So gathered, and hung about the neck, it mightily helps melancholia, and drives away all fantastical spirits. Philes, a Greek author that flourished about the time of Michael Paleologus, writes that the skin of a sheep or kid, whom a wolf has worried ('raptus ab ore lupi') ought not to be worn about a man at all, because it causeth palpitation of the heart. A ring made of the hoof of an ass's right forefoot is an amulet of great virtue. Pæony doth cure epilepsy; precious stones cure most diseases; a spider born with one helps the ague." † The reason which Burton assigns for his belief in the spider is curious enough. He did not believe in it when he saw his mother use it; but when he found it recommended by Dioscorides, approved by Matthiolus, repeated by Alderovandus, he had a better opinion of it, and gave credit to it.

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* Observations on Popular Antiquities, by J. Brand, M.A. vol. iii. p. 269.

† Burton's Anatomy of Melancholy, p. 456.

The Bezoar stone, of which little is now known, but which Bontius describes as being an alvine concretion which forms in goats or gazelles, and has generally a little piece of chaff as a nucleus *, had a great reputation in melancholic affections; Manardus says of it that it takes away sadness, and makes him merry that useth it.† It is certain that these bezoars were much used in medicine by the Arabians, as they are in the East at the present day; and yet, as far as we have been able to discover, they are not described in any of the Arabian works on the Materia Medica, with the exception of Ebn Baithar, and his account of them is very indistinct and unsatisfactory. We may gather from his description, however, that the term was applied to other substances than these alvine concretions. One of his authorities speaks of the best kind being found in the heart of the stag. Like all his countrymen, he recommends the bezoar as an amulet and an antidote to poisons.‡

Lupton, in his second book of "Notable Things," says that the jewel called ætites, found in an eagle's nest, that has rings with little stones within, if tied to the left arm or side, brings this benefit to women with child, that they shall not be delivered before their time; besides that, it brings love between the man and his wife. Again he says, let the woman in labour be girded with the skin that a serpent or snake casts off, and she will quickly be delivered. § Many virtues have been attributed to the Elder: there was, for in-

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* Gray's Supplement to the Pharmacopœia, 179—186.

† Burton's Anat. p. 454.

‡ Paulus Ægineta. Translated for the Sydenham Society by Francis Adams. Vol. iii. p. 427.

§ Brand's Observations, &c. vol. ii. p. 63.

stance, a vulgar prejudice that if boys were beaten with an elder stick it hindered growth.* An amulet against erysipelas is "elder on which the sun never shined." A piece cut out between two knots, and hung about the patient's neck, was much commended.†

Dr. Henry, in his "History of Britain," informs us that amongst the ancient Britons, when a birth was attended with difficulty or danger, they put certain girdles made for that purpose about the woman in labour, which they imagined gave immediate and effectual relief. Such girdles were kept with care till very lately in many families in the highlands of Scotland. They were impressed with cabalistic figures, and the ceremony of applying them was accompanied by words and gestures, showing the antiquity of the custom, and that it came originally from the Druids. ‡

M. de Montfaucon has examined and given plates of many Gnostic amulets or abraxas §, and has divided them into seven distinct classes, according to their inscriptions. The first contains such as have at the top the head of a cock, which is the symbol of the sun; the second class such as have the head or body of the lion, expressive of strength—on these the word Mythras is often inscribed; the third class embraces all that have the figure or inscription of Serapis; the fourth class is composed of such as have sphinxes, apes, and other animals engraved on them; the fifth have human figures with the names Iao (the abbreviation of Jehovah), Sabaoth, Adonai, &c.; the sixth class contains such as have inscriptions without figures; and the seventh class includes those which have monstrous forms. The interlaced double triangle has been alluded to as a charm of great repute, and when the sacred name of God (יהוה) was engraved in the centre, the amulet was supposed to be capable of every miraculous power, even to the extent of suspending the laws of nature. The cabalistic word Abracadabra, which may have arisen from the expression Abraxas, written in a triangular form, thus,

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* Brand's Observations, vol. iii. p. 284.

† Idem. p. 284.

‡ Idem. vol. ii. p. 67.

§ L'Antiquité expliquée et représentée en Figures, par Bern de Montfaucon. Paris, 1719–24. The term *abraxas* is an anagram of names, implying the mystery of the Trinity.

A B R A C A D A B R A
B R A C A D A B R
R A C A D A B
A C A D A
C A D
A

was considered to be peculiarly efficacious against all diseases; and if suspended round the neck or worn over the stomach, it was supposed to prolong human life to an indefinite extent.

It has been thought proper, even at the risk of being tedious, to dwell somewhat on these superstitions in order to illustrate the spirit of an age when the wisest and best of men firmly believed in them. Thus Alexander, a learned physician and philosopher of the sixth century, who was born at Tralles in Asia Minor, and therefore surnamed Trallianus, after travelling for improvement into France, Spain, and Italy, took up his residence at Rome, where he acquired a great reputation. He described diseases with great truth; his style of writing was elegant; he was the first to open the jugular vein in disease, and was also the first to administer steel in substance. He was more learned and more exact than his predecessors in Therapeutics, and collected those remedies principally which he found to be most effectual in their operation; but in spite of all this he partook of the credulity of his time, and trusted to amulets, talismans, and charms. For epilepsy he prescribed a piece of a sail from a wrecked vessel, worn round the arm for seven weeks (lib. i. c. 20); for colic, the heart of a lark attached to the right thigh; in nephritic pains, an amulet representing Hercules overcoming a lion. As an excuse, however, for this senseless practice, he states that his most affluent patients were unwilling to submit to any rational treatment, and that, to content them, it was necessary to have recourse to such other means as were reputed to be curative, amulet and charms amongst the rest! (lib. viii. c. 7, 10.)

He was not, like his contemporaries, a blind follower of Galen; for he occasionally criticises his curative rules as uncertain, and sometimes even condemns them as erroneous. He accepted the general principles of the Methodici, denominated *strictum* and *laxum*, as indications for his rules of practice; but recommended his fellow-practitioners to consider the age, sex, natural forces, individual constitution, and ordinary habits of their patients in the administration of remedies. In his treatment of gout he imposed a severe regimen, and prescribed the Hermodactylus as a remedy. As far as we know, he is the earliest writer that treats of the hermodactylus by name, and he recommends it for the cure of arthritic diseases. Now the hermodactylus was at one time thought to be an Aristolochia; but in the commentary on the former, as contained in the translation of Paulus Ægineta by Mr. Adams, there is presumptive proof of its identity with the *Colchicum* *autumnale* *, which is still employed, and which formed the basis of the famous "Eau Médicinale d'Husson." †

The works of Trallianus were translated into Latin by Haller, together with Dr. Freind's account of his practice. This work was abridged by Dr. Edward Milward, under the title of "Trallianus Redivivus," for the purpose of showing that many of the Greek authors who flourished after Galen are far from deserving the imputation of mere compilators. ‡ Alexander Trallianus acquired the reputation of being, next to Hippocrates, the best Greek physician. He studied nature, observed correctly, and described as he observed.

It would have been a great and glorious thing if we could have represented him as a model of stern virtue and heroic independence, scorning alike to abjure the resources which Dioscorides bequeathed to him, as well as to pander to the caprice of his patients on the score either of sentiment or convenience; for it would have argued the consciousness of possessing sound principles and rules of practice which satisfied his reason: but it is perhaps too much, even with such advantages, to look for a standard of purity, ideally lofty, in an age of corruption; to say nothing of any other motive that may have beguiled him into the heresy which he endeavoured to extenuate by reason of the crotchets of his patients.

There is a subject in the history of the sixth century which possesses peculiar interest, and that is, the outbreak of the plague. Gibbon, in his Roman History, has made that awful visitation a prominent feature of the period. It is the more interesting, in a medical point of view, because it points most significantly to secondary influences as predisposing causes of the epidemic, rather than to the immediate agency of those natural phenomena which then occurred; and in consequence of which the nations of Europe were seized with terrors and apprehensions which were fearfully fulfilled by the events which followed.

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* Paulus Ægineta, vol. iii. pp. 114, 115.

† Nouvelle Biographie Universelle, art. "Alexandre de Tralle."

‡ The earliest Greek edition of Trallianus was one corrected from a MS. copy, and published by Peter du Chatel, Bishop of Macon, and Grand Almoner of France. Paris, 1548.

In 526, Antioch was destroyed by an earthquake, when 250,000 of its inhabitants perished. Five years after, a resplendent comet appeared in the west, which was followed by a remarkable paleness of the sun; so much so that, according to Cedrenus, it gave only a gloomy light, like that of the moon, and appeared as if eclipsed. The crops failed, and Baronius states that the corn which was gathered was deficient in nourishment. In addition to these calamities, Italy had been overrun by the Goths, and the land was left untilled, so that a dearth prevailed; and in 539, when another comet appeared, this was aggravated into an absolute famine, so that many persons are said to have fed on human flesh. This continued until 542, when a destructive plague began, first at Pelusium, in the Delta of the Nile, and from thence extended eastward into Palestine and India; and westward to Alexandria, the north coast of Africa, and to the continent of Europe, over the whole of which it spread its fatal influence. In the spring of 543 it extended to Constantinople, wherein, during four successive months, from 5000 to 10,000 individuals perished daily. Procopius, who was then living and versed in medicine and surgery, was the historian of the period, forming, as it were, the connecting link between ancient and modern history, and was the spectator of the events which he recorded. Gibbon affirmed that, in his narration of the symptoms and progress of the disease, he emulated the skill and diligence of Thucydides in the description of the plague of Athens. The homage, however, which Gibbon paid to the physicians of Constantinople is somewhat incompatible with the remark of Procopius, that the most celebrated of them gave an unfavourable prognosis in the case of most of those who recovered, and predicted a recovery to many who died immediately after. *

We can understand the anxiety which every good and honest physician would feel for the relief of those fellow-creatures who committed themselves to his care, and how, when driven to his wits' end for remedies against so dreadful a distemper, he should, for the want of them, have grasped at a shadow which was universally approved.

We are slenderly supplied with traditions and narratives exhibiting the manners and peculiarities of our own countrymen during the sixth century, when the events which led to the establishment of Christianity in England took place; yet surely those circumstances may be thought to have considerable interest attached to them on their own account, as they also have on account of the influence which they exercised on medicine.

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* Corpus Scriptorum Historiæ Byzantinæ, editio emendatior et copiosior, consilio B. G. Niebuhrii. Bonnæ. Procopius, vol. i. pp. 249–254. "Id porro vere affirmare possum, celeberrimos medicos mortem pluribus prædixisse, qui paulo post contra omnium opinionem convaluerunt; vice versâ salutem multis, quos manebat, qui statim est consecutus, interitus. Quare nulla in hoc morbo causa, quæ ad humanam rationem ducat, occurre quibusdam potest."

We know, however, that the Druids were the only physicians amongst the Gauls and Britons; and, as Strutt observes*, "the people were the more particularly inclined to make application to them for relief, because they thought that all internal diseases proceeded from the anger of the gods, and therefore none could be so proper to make intercession for them as the priest of those very deities from whom their afflictions came; for this cause also they offered sacrifices when sick; and if dangerously ill, the better to prevail upon the gods to restore them to health, a man was slain and sacrificed upon their altars."

The Druids appear to have had some general knowledge of anatomy, which they probably derived from the long course of human sacrifices which they made. Their practice of surgery, without doubt, extended to the healing of wounds, setting of broken bones, the reducing of dislocations, and such obvious branches of the art. Yet all this was not done in a plain ready way; but the simplicity of their practice was concealed, and numberless charms, spells, and incantations made use of, to deceive the patient and increase their own consequence.

Their medicines were composed of the juice and decoctions of various herbs; hence botany was studied by them. The Mistletoe and the herb Samulos they greatly esteemed, and observed certain ceremonies in cutting the one from the tree whereon it was found, and in gathering the other. First, the collector was to do it fasting; secondly, he was on no account to look backward whilst doing it; and, thirdly, he was enjoined to do it with his left hand. When thus possessed, the branches or herbs were laid in water, and all who partook of that water were effectually protected from diseases. Selago (a kind of hedge-hyssop) and Vervain were highly prized by the Druids. The person gathering them was clothed in a white garment, and offered a sacrifice of bread and wine before taking them; when he had so done, he covered his right hand with the skirt of his robe, and with a hook made of a more precious metal than iron, cut up the herb, placed it carefully in a clean cloth, and when thus gathered, either herb was supposed to possess various wonderful qualities, being a powerful charm and preservative against misfortunes and sudden accidents of all kinds.

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* The Chronicle of England, by Joseph Strutt, vol. i. pp. 278, 279.

Gregory I. (surnamed the Great), whose name is celebrated in English history from his mission for the conversion of our islands, affected the most supreme contempt for profane literature as well as for the arts and sciences; but, curiously enough, it was his fate to help most materially the cause to which he was so vehemently hostile; for, although he cared not for science, he endeavoured to propagate his faith in Christianity by sending missionaries to all parts of Europe, many of whom, like Theodoric in England, encouraged the study of literature and medicine.* A most remarkable passage occurs in the writings of Gregory, which is probably the earliest, and certainly the most unequivocal enunciation of one great dogma of the system of Homœopathy, and strikingly accords with another propounded by a Saracenic writer, which we shall have to refer to, as tending to confirm the notion that that system was practised at this early period. It runs thus—"Mos medicinæ est ut aliquando similia similibus, aliquando contraria contrariis curet. Nam sæpe calida calidis, frigida frigidis, sæpe autem frigida calidis, calida frigidis sanare consuevit."* The identity of words renders it impossible to read the above paragraph without a suspicion that an old and obsolete tenet may have been reproduced to the world under the garb of a new discovery; but if it be not *absolutely* true that human nature is destined to renew its acquaintance from time to time with exploded doctrines, just as we renew our acquaintance with bygone diseases, it is an apt illustration of the proverb advanced by an authority far more unerring than we can pretend to, that "there is no new thing under the sun." The last classical Greek author of whom I shall have to speak, in consequence of the reputation which he enjoyed, is Paulus Ægineta, a native of the island of Ægina. Although it is not positively known in which century he flourished, Dr. Milward has shown by inferential reasoning that he cannot have lived at an earlier period than the end of the sixth or the beginning of the seventh.† He studied at Alexandria before it was taken by the Arabs, and there copied part of the works of Alexander Trallianus, who was his favourite author: after which he travelled over Greece and other countries to gain information respecting the medical art. On his return he established himself in Rome, where he wrote an abridgment of the works of Galen, and an original treatise on Dart and Arrow Wounds, which was greatly admired by Fabricius of Aquapendente. He appears to have been particularly skilful in the disorders of the female sex, and is the first in antiquity who deserves the title of accoucheur.* But in every branch of his profession he attained great eminence, and was looked on as one of the highest authorities during a long succession of ages. His principal work, "De Re Medica," has been translated from the Greek by Mr. F. Adams for the Sydenham Society, and contains a commentary, embracing a complete view of the knowledge possessed by the Greeks, Romans, and Arabians on all subjects connected with medicine.†

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* V. A. Hubner on the English Universities, translated from the German by Francis W. Newman, vol. i. p. 45.

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* Patrologiæ, seu Bibliotheca Universalis, integra, uniformis, commoda, œconomica, omnium SS. Patrium Doctorum Scriptorumque Ecclesiasticorum, &c. Moral. lib. xxiv. caput 2. My friend, Sir John Dalberg Acton, pointed out to me this curious and interesting passage in the writings of Gregory the Great, which has been copied also into the Literary Notices of the Rambler, vol. ii. part iv. page 105.

† Milward, Edward, Letter to Sir Hans Sloane, in Vindication of the Greek Writers in Physick after Galen, particularly Alexander Trallian. London, 1733.

In spite of the many blank pages in the history of the first four centuries of the Christian era, we, no doubt, may form a pretty correct estimate of the course and vicissitudes of the medical profession as it then existed, and trace its relations to the public for many ages after. It has been our endeavour to describe the various sects into which it was divided; and to each we are bound to concede the advantage of its being the offspring of a deep and honest conviction. However much we may be disposed to underrate them now, it should be borne in mind that there is still no legitimate mode of acquiring medical knowledge which was not followed by some one or other of those sects.

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* Eloy (N. F. J.), Dictionnaire Historique de la Médecine, Ancienne et Moderne.

† The Seven Books of Paulus Ægineta. 1847.

The Dogmatists were undoubtedly the most philosophic, insisting, as we have seen, on the necessity of exercising the faculty of reason on the structure and functions of organs in the treatment of disease. The Pneumatists, Methodists and Eclectics allied themselves more closely with them than with the Empirics, who affected to despise the employment of reason, and regarded experience and analogy as the highest qualifications.

All assented to the importance of correct observation, and all were more or less influenced by the Pyrrhonian scepticism, which was certainly intended to act as a preservative against error and precipitate judgment; but the universal doubt which it engendered undermined belief in the infallible laws of nature, to the perversion of sound judgment, and, "by corrupting the best things, it favoured the production of the worst."

In summing up the results of the labours of each sect, the balance appears greatly in favour of the Dogmatists; for, much as the Empirical school is entitled to our respect for the curious and interesting information which it has transmitted to us respecting the manner in which medicine was studied*, when we refer to the successive discoveries of facts which advanced the science, we find them associated with the names of the Dogmatists and their allies.†

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* This homage is more particularly due to Nicander, Scribonius, Marcellus, Sextus Empiricus, and Valerianus.

† Aretæus, Galen, Oribasius, Cælius Aurelianus, Trallianus, and Paulus Ægineta.

After the death of Galen, notwithstanding that Alexandria, Rome, and Constantinople maintained their reputation as schools of medicine, the science itself waned, in consequence of the Gothic invasions over the civilised world. The sects, as we have seen, dwindled down to individuals, who achieved for medicine what the monastics effected for ancient classical literature: they maintained it in the condition of a small, but continuous stream, in the midst of so much charlatanism that no man could talk nonsense so gross, or profess supernatural powers so incredible, but that the ignorance of the community would give credit to his assertions.

It is scarcely possible for any person to read, without amazement and humiliation—not unmixed, however, with a certain amount of pride—an account of the display of incapacity and credulity which encouraged the union of so much falsehood with the mere threads, and, as such, *a continuity* of truth. They were not simply united, but positively interwoven like warp and woof. And yet how incompatible was the simple observation of the acts of nature with a belief in those miracles which violate all her laws!—

> "Think we, like some weak prince, th' Eternal Cause
> Prone for his favourites to reverse his laws?"

contradicting sense and reason so entirely, that it would now seem to those, at least, who are so prosaic as to enquire into the character of the agents and the antecedents of the objects of supernatural events before accepting them as true—to be a work of supererogation to adduce an argument for the purpose of disposing of a doctrine so unworthy of refutation. To those, however, who are curious in the matter, and are desirous of testing the truth or falsehood of any testimony respecting miraculous and supernatural acts, we would commend the observations of Hume* on this dark page of our history; and with the final extinction of the school of Alexandria, when that city was taken by the Saracens in 641, we terminate this part of our subject.

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* Hume's Essays on Miracles, vol. ii.

CHAP. V.

SARACENIC SCHOOL OF MEDICINE.

Having established their dominion by force, the Saracens gave early promise to perpetuate it in ignorance; for the destruction of the celebrated library of Alexandria was one of the first acts of the Caliph Omar.

It has been supposed by some competent judges that the loss may, probably, have been accidental, and attributable to the disorders and tumults which immediately succeeded the capture of the city [*]; but the researches of others tend to confirm the belief that the conquerors tarnished their laurels by sacrificing to the Alcoran 800,000 volumes, which could never be replaced. Mr. Ockley has given the following account of it [†]:—"On the surrender of Alexandria, the commander of the forces (Amrou) became so well pleased with the famous scholar John, surnamed the Grammarian, on account of his learning and conversation, that the latter ventured to petition Amrou for the books contained in the library, seeing that they had not been noticed in the list of proscribed things contained in the city, and which had been sealed up. Amrou replied, that he had no power to grant the request, but that he would write to the Caliph Omar to see what might be done. This he did, and the Caliph answered as follows: 'What is contained in these books you mention is either agreeable to what is written in the Book of God (meaning the Alcoran), or it is not; if it be, then the Alcoran is sufficient without them; if otherwise, 'tis fit they should be destroyed.'" Amrou, in obedience, distributed the books throughout the city amongst those who kept baths (of whom there were in Alexandria 4000), to heat the baths with; and it took six months to destroy them all. Despising science generally, they burnt all scientific books; but, cherishing life, they rescued those medical works which were likely to assist in prolonging it.*

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[*] Essai Historique et Littéraire sur la Médecine des Arabes, par P. J. Amoreux, p. 8.

[†] History of the Saracens, Ockley, vol. i. pp. 312, 313.

Happily there were those who were capable of appreciating the medical works; or, at least, of suspecting that they might, at some future time, be useful for the purpose of alleviating diseases, to which all were liable, and thus many manuscripts were preserved.

It was, perhaps, wisely determined that the western world should pass through the crisis of this particular period; for the Greeks, with whom civilisation still lingered, were sadly degenerated from those sages who graced the classic ages, and had sunk under the trammels of despotism, superstition, and ignorance.

The Arabians possessed a copious and expressive language, their imaginations were lively, and their passions violent. They were active and energetic; and, although they had made no progress in science when they overran the western world, they had cultivated poetry and fiction with some success. They were not, therefore, absolutely insensible to the charms of literature; on the contrary, after their conquests were completed, their destructive violence subdued, and their Caliphs quietly seated upon the greatest and most powerful throne that the world had ever seen, they turned their attention to the means of acquiring knowledge, and endeavoured to atone for the destruction they had practised by accumulating manuscripts for the library of Cleopatra.* In the mean time we may obtain a glimpse of the relationship which existed between the members of the medical profession and the public, by casual narratives rather than by any special history. The most vivid instance that no inconsiderable amount of reading has furnished, does not represent the medical practitioners in the most dignified position; but it is so far clothed in circumstances as to supply the information we seek for.

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* Portal, vol. i. p. 135; see also Amoreux, p. 13.

"The famous Ziyad (brother of the Caliph Moawiyah), being struck with the plague (A.D. 672), felt such intolerable pain in his hand that he consulted a Cadi † whether it were better to cut it off or not. The Cadi told him that he was afraid, if his time was come, he would go before God without that hand which was cut off to avoid the appearing before him; and if it was not come, he would remain lame among men, which would be a reproach to his child; wherefore he was of opinion that, live or die, he had better let it alone; and so left him. However, notwithstanding this grave decision, Ziyad, impatient of the pain which increased every moment, was resolved to have it cut off; but when he saw the fire and the cauterising irons, his heart failed him. It is said he had about him no less than 150 physicians, three of whom had belonged to Cosroes, the son of Hormuz, King of Persia;

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* Amoreux, p. 9.

† The Cadis were men learned in law, not medicine.

but it was not in their power to reverse the sealed decree, nor the thing that was determined."[*]

When all public instruction had ceased at Alexandria, and before its renewal became an object of solicitude with the Caliphs, a school was formed at Antioch, the capital of Syria (A.D. 721), where many Greek works on medicine are said to have been translated into Syriac.[†] In 763 the Caliph Mansur, or Almansor, founded the city of Bagdad; and, two years after, he established a college, which, in a short space of time, acquired great celebrity; he also instituted public hospitals and a medical school to facilitate the acquisition of a knowledge of disease. Laboratories, moreover, were erected for the purpose of preparing medicines; and in these establishments it is supposed that the science of chemistry may have first originated.[‡] Here Geber, the patriarch of chemistry, laboured to produce an universal remedy, of which we shall have to speak hereafter; and the works of Hippocrates and Galen, the latter especially, were made the text-books, and were assiduously studied by professors and pupils, of whom there were said to be no fewer than 6000; but inasmuch as the practical study of anatomy was forbidden to the true disciples of the Prophet, they were compelled to trust for their knowledge of this subject to the writings of the Greeks, as they were content to do for that of most other subjects, seeing that Islamism and true science were too much at variance to admit of any original investigation.[§] Galen, being more discursive than Hippocrates, gave a greater scope to their imaginations, and was therefore their favourite author; and, as their commerce with India furnished them with many new simples, an amplification of their Materia Medica was an early result of their increased appliances.*

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[*] Ockley, vol. ii. p. 112.

[†] Amoreux, p. 12.

[‡] Thomson's History of Chemistry, vol. i. p. 112.

[§] Sprengel.

From the eighth to the tenth century Spain was preeminent in commerce, manufactures, population, and wealth; the sciences were cherished and protected, if not absolutely advanced; and at Cordova a college was established, which, under the Caliphat of the three Abdalrahmans and Alhakem, was the most celebrated in the whole world. Thither all the Christians of the western world repaired for information, and not unreasonably, for its library contained no fewer than 280,000 volumes in the tenth century, and in the twelfth there were seventy public libraries in that part of Spain subject to the Caliph of Cordova.† Colleges of a similar character were likewise established at Granada and Malaga.

The most enlightened of all the Caliphs was Almamon, who ascended the throne in 813. During his reign the Saracenic schools acquired considerable knowledge of Greek science; for he commanded new translations to be made, wherein he was obeyed with as much earnestness as had formerly been employed in the work of demolition. His conduct, however, inflamed the religious zeal of the faithful, who devoted him to destruction for favouring philosophy, and in that way diminishing the authority of the Alcoran. He was succeeded by Almotassam, who also cherished the sciences and extended his protection to learned men who were Christians. Motawakkel followed this latter on the throne, and re-established the school and library of Alexandria.

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* Amoreux, p. 17.

† Thomson, vol. i. p. 114.

To these Saracenic colleges some authors have been disposed to attribute the institution of all other universities*; but, as Mr. Hallam has justly remarked, "they were unconnected with each other, though in the same city; nor had they, of course, those privileges which were conferred in Christendom. They were, therefore, more like ordinary schools or gymnasia than universities."† Although the Arabs extended their conquests over so many other nations, they never progressed beyond the state of pupillage themselves. The truths which the Greeks had mastered were the boundaries beyond which the most exalted intelligence failed to transcend; "where the Greek ceased to communicate, there the Saracen ceased to advance."‡ There are, in fact, few Arabian writers in whose works we find either philosophic ideas, successful researches, new facts, or great and important truths. A servile habit of compilation, and the multiplication of spurious writings characterised their literary efforts: they were, for the most part, content to write commentaries on the classical authors of Greece, and to select from them such fancies as tallied with their own superstitious minds; so that every tributary stream was tainted with the marvellous, and the main channel of medical literature was greatly corrupted.

Physicians, however, appeared from time to time, who were obviously men of genius and erudition; but in their writing they never lost sight of their Greek models. The great majority—and there were many, as we may gather from the catalogue of authors given us by Reiske and Faber*—"borrowed so much, and so much perverted what they borrowed," that their works were soon forgotten, though many of their errors remained.

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* See for this, André's Histoire Littéraire de la France.

† Hallam's Literary History, vol. i. p. 17.

‡ Advancement of Society in Knowledge and Religion, J. Douglas, p. 39.

One of the earliest celebrities was Honain-Ebn-Izak, a Nestorian of the ninth century, who was renowned for reproducing in Arabic, Hippocrates, Galen, Pliny, and Aristotle; and it was a fortunate circumstance when the sterling metal of the Greeks was subject to the transmutation of one alloy only; for the most ordinary process of translation was first into Syriac, and from the Syriac into Arabic.

Another Syrian Christian, Mesué or Mesuach, also of the sect of Nestorians, acquired a reputation by his translations of Greek medical authors, as well as by his eminence as a physician. The Caliph Raschid esteemed him so highly that he committed to him the care of his son Almanion; who, when he succeeded to his father's throne, in 813, was imbued with the love of science to such an extent that he suffered, as we have seen, in consequence of the zealous protection he extended to it. Thus it was that Mesué rendered a greater service to medicine by his position and influence than by his actual writings. His social habits were such as to make him a great favourite with the community; for, according to his biographer, Abulpharge, he was accustomed to hold conferences on philosophy at his own house, and to give lessons in medicine, which were extremely popular from the jocular spirit in which they were communicated.

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* Opuscula Medica ex Monumentis Arabum et Ebræorum, Joannis Jacobi Reiske, M.D., et Joannis Ernesti Fabri.

Galen was their great authority in anatomy, Dioscorides in botany, and for their rules of practice they perverted Hippocrates. This was probably owing to the multitude of medicinal and dietetical articles with which they were acquainted, and, like other prodigals, used unwisely. The works of Serapion the Saracen and Ebn Baithar supply us with lists of remedial agents, showing that the Arabians added very many articles to the Materia Medica.* They used gems and precious stones somewhat largely; but whether with the conceit of making their draughts more costly, or with the erroneous notion that they had virtues, is uncertain; perhaps sentiment prevailed, notwithstanding that Rhazes quotes Dioscorides as saying that the lapis lazuli is good for sore eyes and promotes the growth of the eyelashes, and Avenzoar recommended the emerald as good in dysentery.

They were also firm believers in astrology, which they mixed up with their chemistry; a combination, as Mr. Prescott has observed, "natural to a state of imperfect civilisation, where the mind, impatient of the slow and cautious examination by which alone it can arrive at truth, launches at once into the regions of speculation, and rashly attempts to lift the veil which is drawn around the mysteries of nature. It is the characteristic of true science to discern the impassable, but not very obvious, limits which divide the province of reason from that of speculation. Such knowledge comes tardily, and many an age has passed away in which power that, rightly directed, might have revealed the great laws of nature, has been wasted in brilliant, but barren reveries in alchemy and astrology."

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* The Arabians added camphor, senna, musk, nux-vomica, myrobalans (Emblica officinalis), aloes, manna, cassia, rhubarb, and tamarinds. Working, as they did, in metallurgy, many metallic salts may then have been introduced for the first time into the practice of medicine; but a correct list is a desideratum which is not likely to be supplied.

The fertile and lively imagination of the Saracens greatly favoured the superstitious practice of interpreting dreams. So favourite a subject was this with their medical authors, that the names of 7000 individuals have been recorded as celebrated in this particular profession.* They had also their magic and astronomic talismans: texts also from the Alcoran were sold by the Moorish priests, under the name of fetishes, as preservative agents against evil spirits and disease.

As if no theory could be too fantastic and extravagant, an early writer, named Alkhendi, or Alkindus, attempted to explain the activity of medicines by arithmetical or musical rules, and considered that a calculation of proportions, and the geometrical admixture of the elements of medicines were more important in the development of their occult forces than the elements themselves; and Cardanus, in the sixteenth century, looked back on him as one of the most profound spirits of his age.† He was, certainly, not deficient in imagination, nor in boldness in expressing the idea of dynamic immaterial forces as inherent in the geometrical proportions of medicines rather than in the medicines themselves. It does not appear how far he considered the quantity unimportant, so long as the proportions were correct; nor whether his theory was sufficiently explanatory and persuasive to carry with it the assent of his contemporaries.

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* Hassan Ben Hossain Al Khalal wrote the lives or histories of 7000 interpreters of dreams. See Amoreux, p. 224.

† Sprengel and Amoreux, page 143.

A far more important and much greater celebrity was Rhazes, who lived in the tenth century. In early life he applied himself to music; but, feeling the want of an useful profession, he embraced the study of medicine. For the purpose of acquiring information therein, he travelled in Syria, Egypt, and Spain, and subsequently established himself in Bagdad, where he was selected from amongst upwards of a hundred competitors to undertake the direction of the hospital.* He was a better anatomist than any other Saracen; but his observations were confined almost exclusively to the organ of voice. He first described the pneumo-gastric nerve, and distinguished the superior laryngeal from the inferior or recurrent. He had more than ordinary opportunity of acquiring a knowledge of medicine, not only by his extensive reading, but by his experience in different countries, which was great also; and a characteristic anecdote is related of him, illustrating the honesty of the man, and elucidating the many so-called restorations from death, or rather from fits, which the ignorant are, at all times, prone to exaggerate into death. One day, in the streets of Cordova, he fell in with a crowd surrounding a citizen, who was said to have suddenly fallen down dead; but, on carefully examining him, he requested the bystanders to bring some rods to him, with which he began to beat the body, especially the soles of the feet, and invited others to follow his example. It is said that he was ridiculed for his folly; but shortly the supposed corpse gave signs of life, whereupon all thought that a miracle had been performed. Rhazes, however, received the laudations as he had before done the derisions; but, instead of abusing the witless credulity of the multitude, he at once protested that he knew not how to restore the dead to life. "What I have done," said he, "I once saw practised in the Desert, where a fellow-traveller fell, as this man has fallen; an old Arab ran and cut some switches, and distributed them for administration, as we have done, and with the same effect." His friend, Almanzor the Caliph, said that the country wherein he resided could, at least, boast of possessing a Galen; to which Rhazes replied, "Experience is better than the doctor."

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* Amoreux, p. 100.

His chief work is that on Small-pox and Measles, wherein he attempted the solution of a question respecting the history of the former, on which various opinions were obviously entertained at the time he wrote; for he begins his treatise with the following passage: "As to any physician who says that the excellent Galen has made no mention of the small-pox, and was entirely ignorant of this disease, surely he must be one of those who have either never read his works at all, or who have passed over them very cursorily."* Rhazes did not himself understand Greek, but arrived at the above conclusion by enquiring of those who did; and it is supposed, with great probability, by Dr. Channing, that the Greek word first used† was mistranslated into Arabic; and hence the error of

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* Rhazes on Small-pox, translated by W. A. Greenhill, cap. i.

† *ἴονθος* is the word in question, which was first used by Hippocrates and Aristotle, and is also found in Aretæus, Dioscorides, and Galen. The latter defines it to be "a small hard tumour, which arises on the skin of the face, containing a thick humour." It is, however, the *acne* of Drs. Willan and Bateman. Vide Rhazes, by Greenhill, note D, page 142.

Rhazes, as well as of others who have, with the accomplished and laborious Dr. Hahn, attempted to prove that Hippocrates, Celsus, and Galen described the disease.* The Greek writers, however, were so perfectly clear and correct in all their descriptions of diseases, that they have been recommended as models for imitation; whereas, in no place have they given an account of a distemper like the small-pox, so clearly defined as the Arabians, who were very inferior writers, defined it. The whole question is admirably treated in the work of Mr. Moore †, who shows that the disease may have existed in China ‡ and Hindostan § in the remotest ages; that it was probably confined there in consequence of the peculiar situation of those regions, separated from the rest of the world by deserts and ocean; that eventually, as Dr. Freind suggested, it was first brought into Egypt during the Caliphat of Omar, about the year of Christ 640, by the Arabians, who had been infected by those eastern nations; and that thus the disease was propagated over Europe; after which, to follow the progress of the small-pox is to proceed with the history of the Arabs. We by no means diminish the difficulty of accounting for the origin of the distemper by saying that it was coeval with the human race; but, in attributing it to filth and its accompaniments, we very probably approach the truth; for we may as easily conceive that small-pox and other infectious diseases may be engendered by the absorption of deleterious miasms and other local influences, as that pellagra, cretinism, or the ague, may originate from similar causes.

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* Joannes G. Hahn. Variolarum Antiquitates e Græcis erutæ acced. de Mesuæ Scriptis Epistolis. Brigæ, 1733.

† History of Small-pox, by James Moore, p. 3. Lond. 1815.

‡ Mémoires concernant l'Histoire, les Sciences, &c. des Chinois, par les Missionnaires de Pékin, tom. iv. p. 392.

§ Holwell's Account of the Manner of Inoculating the Small-pox in the East Indies. 8vo. Lond. 1767.

The above remarks are equally applicable to Measles (Rubeola); for, according to Gruner*, the disease appeared in Europe at the same time as small-pox, and was diffused over France by the invasion of the Saracens. Rhazes was the first who gave an accurate description of both diseases; and the term *rubeola* appears to be derived from the Spanish *rubio* (red); for it was formerly called *rubiola;* hence it is supposed that it may have emanated from Cordova. In Italy it was called *morbilli*, or the Minor-plague, being the diminutive of *il morbo*, as the Italians called the Plague.

Rhazes gives a curious description of the impostors of his day, showing how much quacks have prevailed in all ages, and, generally, under similar circumstances. "There are," says he, "so many little arts used by mountebanks and pretenders to physic, that an entire treatise, had I a mind to write one, would not contain them; but their impudence and daring boldness is equal to the guilt and inward conviction they have of tormenting, and putting persons to pain in their last hours, for no reason at all. Now some of them profess to cure the falling-sickness, and thereupon make an issue in the hinder part of the head, in form of a cross, and pretend to take something out of the opening, which they held all the while in their hands. Others give out that they can draw snakes and lizards out of their patients' noses, which they seem to perform by putting up a pointed iron probe, with which they wound the nostril until the blood comes; then they draw out the little artificial animal, composed of liver, etc. Some are confident they can take out the white specks in the eye. Before they apply the instrument to that part, they put a piece of fine rag into the eye, and, taking it out with the instrument, pretend it is drawn immediately from the eye. Some, again, undertake to suck water out of the ear, which they fill with a tube from their mouth, and hold the other end to the ear; and so, spurting the water out of their mouths, pretend it came from the ear. Others pretend to get out worms, which grow in the ear or the roots of the teeth.* Others can extract frogs from the under part of the tongue, and, by lancing, make an incision, into which they clap the frog, and so take it out. What shall I say of bones inserted into wounds and ulcers, which, after remaining there for some time, they take out again? Some, when they have taken out a stone from the bladder, persuade their patients that still there is another left: they do this for this reason, to have it believed that they have taken out another. Sometimes they probe the bladder, being altogether ignorant and uncertain whether there be a stone or no; but if they do not find it, they pretend at least to take out one they have in readiness before, and show that to them. Some say they take phlegm, of a substance like unto glass, out of different parts of the body, by the conveyance of a pipe which they hold, with water in their mouths. Some pretend that they can contract and collect all the floating humours of the body into one place by rubbing it with winter cherries, which causes a burning or inflammation, and then they expect to be rewarded as if they cured the distemper; and after they have supplied the place with oil, the pain presently goes off. Some make their patients believe they have swallowed glass; so, taking a feather, which they force down the throat, they throw them into a vomiting, which brings up the stuff they themselves had put in with that very feather. Many things of this nature do they get out, which these impostors, with great dexterity, have put in, tending many times to the endangering the health of their patients, and often ending in the death of them. Such counterfeits could not pass with discerning men, but that they did not dream of any fallacies, and made no doubt of the skill of those whom they employed; till at last, when they suspect, or rather look more narrowly into their operations, the cheat is discovered."

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* Gruner (Christianus G.), Variolarum antiquitates ab Arabibus solum repetendæ, pp. 7, 14, 17.

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* See also "Pictures of the Chinese," a book with lithographs, published by the Rev. Mr. Cobbold. Therein the extraction of the worm will be read just as Rhazes describes it.

It would not be an uninstructive chapter in the history of human events, if some philosophical individual would sit down and write the rise, progress, decline, and fall of all popular delusions. Medicine would furnish a rare field of observation, not only before and during the first few centuries of Christianity, but even up to this our day; it would afford copious instances of the implicit belief which has been accorded to supernatural agencies and impudent quacks, and would show too that all impostures, however ingenious and vivacious they may be, have a fixed limit to their career, like all other things; they have their entrances and their exits, flourishing for awhile, until at last, stale and exploded, they sink down into oblivion.

But Rhazes himself, whilst fully alive to these gross practices of the low charlatan, was a firm believer in astrology and alchemy, which, like preceding delusions, have given place to other errors equally monstrous, and they, in their turn, have succumbed to others still. The frequent recurrence of these delusions, or mental aberrations, would seem almost to require a classification like that which obtains for bodily infirmities, or for those parasitical animals which attack and subsist on higher grades of organisation. I shall have to notice the most popular of these epidemics, which are never wholly absent from a community, but which break out at times with unusual severity, sparing neither rank, sex, nor age.

After Rhazes, Haly-Abbas or Ali-Ben-Abbas, a Persian by birth, wrote a compendium of medicine under the title of "Almaleci," or Royal Work, which he dedicated to Adhaddoulat, Emir of Bagdad, about the year 980.* Haly was one of those authors concerning whom Mr. Hallam observed, that, "instead of Hippocrates and Galen, the Arabians brought in physicians of their own, men doubtless of considerable though inferior merit, and substituted arbitrary or empirical precepts for the enlarged philosophy of the Greeks."† He was certainly a man of independent mind, and hesitated not to criticise Hippocrates, Oribasius, and Paulus Ægineta, as he sometimes did Galen; but in general he deferred to the latter. He was a great advocate for the use of mineral waters in the cure of diseases, and recommended the admixture of a little of one's native earth, as at all times beneficial.

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* The Almaleci was translated into Latin, under the title of "Opus Regium," by Etienne, in 1127, and was reproduced by Michel Capella in 1523. M. Amoreux (p. 79) quotes the opinion of Mr. Clifton, that the work of Haly-Abbas was the first medical book written in Arabic; but Dr. Freind shows that it must have been written after Rhazes, from whom much is borrowed.

† Hallam's Literary History, vol. i. p. 465.

In the same year that the "Almalechi" appeared, the physician who was destined to eclipse it was born at Bokhara. He is known by a multitude of names, but by common consent he is now called Avicenna.* At a very early age he was educated in the theology of the Koran; after which, at about the age of sixteen, he commenced the study of medicine under a Christian physician, named Ben-Yahya.† At eighteen he acquired great repute by curing the Emir, Nouk Ibn-Mansur, of a formidable distemper, and was loaded with favours in consequence. Amongst others he had the use of the Prince's library, which was afterwards burnt, and its destruction was maliciously imputed to Avicenna. One of his biographers (d'Herbelot ‡) relates of him that, being summoned by a sultan at Khorassan, he refused to go; when commanded, however, by the King Mamon, he departed; but, instead of taking the road to Khorassan, he took that to Georgia, where he distinguished himself by sagaciously detecting the source of disease in a case of love-sickness in a young prince. He was a great philosopher as well as a physician; nevertheless, his life was one continued history of vicissitudes, partly from his own irregularities, and partly from the jealousies of his fellow-practitioners; yet, in spite of his excesses, he appears to have been thoroughly imbued with a religious feeling; for, whenever he recognised a new truth in others, or discovered one himself, he is said to have prostrated himself in humble thankfulness to God. He died at the early age of 57; when the poet who penned his epitaph said of him, that his philosophy failed to give him wisdom, and that the study of medicine had failed to teach him the art of preserving his own life. His great work was the "Canon of Medicine," (*Canûn fitt Thebb**), which was held in high esteem until the end of the fifteenth century; and most implicitly followed in the different schools of Europe. Italy and Paris were the first to renounce him for the original Greek authors; but in Montpellier, Louvain, and throughout Spain, his works continued to be undisputed.

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* Avicenna is an abridgment of Abou-Houssaïn-Ben-Abdallah, Ben-Sina-Al-Scheïkh-Al-Reis. The Mussulmans called him Ebn-sina; the Arabian Jews, Abensina or Aboli-Abiscene, signifying Houssaim, father of Hali, son of Abdalla, grandson of Sina. Amoreux, p. 105.

† Biographie Universelle. Thomson states that he studied under a Nestorian named Abou-Sahel-Masichi. Hist. of Chem. vol. i. p. 134.

‡ Bibliothèque Orientale, par Bartholomew d'Herbelot, avec les Additions de Schulten. Paris, 1782.

Some of the colleges, too, in which he was regarded as the oracle, especially that of Bagdad, disclosed a waning reputation, and were more or less supplanted by a number of Jewish seminaries; for the Jews estimated him most highly, partly on account of the intrinsic merit of his works; but the inspiration was in some degree stimulated by more interested motives. Whilst the consolidation of the barbarian upon the Roman institutions was going on, the Jews, who had been sorely persecuted, were more than suspected of being the secret yet active agents of the Saracens, in return for the spirit of toleration which was extended to them by the disciples of the Moslem faith.

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* It is questionable whether Amoreux has copied correctly قانون في الطب *Canûn fi el Thebb*, for thus it is thought, by competent authorities, it should be written. The *th* is put by the French for *t* alone. *El Tebb*, or, as some dictionaries spell it, *el Tabb*, if written as spoken, sounds *et Tabb*, because *t* being a solar letter, the *l* which precedes it merged in the *t*, and becomes a *t* also. Hence Amoreux gives the word as *et tebb* instead of *el tebb*. But because the preposition *fi* or *fy* (in) comes before *et* or *el*, the final *i* supersedes the *e* in *el*, and the sound becomes *fit*. The three words make *Canûn* (rules) *fi* (in) *el* (the) *tibb* or *tebb* (art of healing).

In addition to the advantages already spoken of, as derived from their course of trafficking with oriental nations, they enjoyed all the privileges of citizenship, and many of them studied medicine so assiduously as to become the best physicians of Europe. Their remorseless enemies, the Christian clergy, having constituted themselves the avengers of Christ, and resolving to deprive them of their honourable profession, and to appropriate its emoluments to themselves, exercised their intolerant and persecuting influence, whereby a canon was enacted, which prohibited the Jews from ministering to the physical infirmities of the Christians. The superior erudition of the former, however, caused the canon to be disregarded, so that kings and popes, the heads of Christian communities, did not scruple to have recourse to them in time of need. Charlemagne, Louis, surnamed le Débonnaire, and Charles le Chauve, had each a Judaical physician*, who could boast of a medical school which the Jews established at Sora, in Asia Minor, as early as the second century. Most of them, at the time of which we are now writing, availed themselves of the Saracenic schools of Spain, and a few, in spite of the persecutions to which they were exposed, of the Christian school of Montpellier, where many ecclesiastics also acquired a smattering of medical lore, to which they were incited by the riches and luxury, as well as by the idleness and voluptuousness which enervated the Moors, and contributed, amongst other causes, to their downfall.*

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* Farraguth was physician to Charlemagne, and Sédécias to Louis and Charles. The latter is said to have been poisoned by Sédécias.

As these influences came into operation, Arabic writers became less numerous, and the authors, whom it may be necessary to quote as giving the tone and character to the Saracenic school, were "few and far between." One of these, Avenzoar, of whom it is said "that he lived to the great age of 130," was the most illustrious physician after Avicenna. During the greater part of his long life he studied the healing art with much diligence, directing his attention chiefly to remedial and dietetical agents, on which he wrote a book entitled "Thaisser;" but, in touching upon the question of giving relief to the sufferings accompanying stone in the bladder, he considered the subject indecent, and the operation of extraction as opposed to the principles of his religion, seeing that it involved the scrutiny of a part of the body too unclean for the eyes of the faithful.† Like Honain, he freely quotes the opinions of Paulus Ægineta, whom he regarded as one of the most eminent of his Greek masters. Avenzoar must have lived during the eleventh and twelfth centuries.‡

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* Cardonne (Denis Dom de), Histoire de l'Afrique et de l'Espagne sous la Domination des Arabes.

† Amoreux, p. 111. There were, in the days of Avenzoar, persons who confined themselves to the operation for the stone, as there are still in eastern countries (see Travels of Lady Hester Stanhope, vol. iii. p. 201), and hence arose the Hippocratic oath taken by regularly bred surgeons—*Ου τεμεω δε ουδε μεν λιθιωντας εκχωρησω δε εργατησιν ανδρασι πρηξιος τησδε* (I will not cut any one for the stone, but will give up this operation to the working men).

‡ Ibid. p. 110.

The next in succession was Averroës *, a patriarch like his predecessor, and a Saracenic commentator of great renown. He flourished during the twelfth and thirteenth centuries †, and was in great repute at Cordova as a physician. He devoted himself to the study of Aristotle with great determination and zeal, and spent his whole life in preparing an exposition of the labours of that author. According to Mantuanus and d'Herbelot, Europe was indebted to Averroës, at the revival of learning, for the knowledge it possessed of Aristotle.‡ Hallam, however, states on equal authority, that he built a theory on a bad Arabic version of Aristotle which he used; and that this theory, which gained much ground at a subsequent period among the Aristotelians, as they deemed themselves, of Italy, was little else than an expansion of the Realist hypothesis, urged to a degree of apparent paradox.§

The celebrity of the Arabian school of medicine can only be attributed to the ignorant and superstitious condition of Europe from the seventh to the twelfth or thirteenth century, and not to any original and independent literature of its own. It was rare to find a layman who could read or write; and even a French monarch (Philip), so late as 1272, was equally uneducated. In no age were the immoralities of the Christian clergy greater. There were no other Chris-

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* Here is another example of the corruption of a name. Who would suppose Averroës was Ebn Rashyd or Raschid, as English authors write it? yet so it is; for the Spaniards named him Aven Roshid, which by degrees got converted into Averroës, the cognomen by which he is now quoted in all medical works.

† Amoreux, p. 113.

‡ Antonius Passevinus Mantuanus, De verâ Philosophia in Bibl. Selecta, tom. ii. lib. xii. cap. 16.

§ Hallam's Lit. Hist. vol. i. chap. iii. sec. 86.

tian schools than those which belonged to monasteries, and no other Christian masters than the debased ecclesiastics, who shared with the Jews and Saracens the practice of medicine. There was no spirit of emulation in literature or science, and no idea of improving on the medical writings of the Greeks, which were almost universally read in Arabic versions. Thus we find Averroës asserting that "the doctrine of Aristotle is the perfection of truth, and his understanding attained the utmost limit of human ability; so that it might truly be said of him, that he was created and given to the world by Divine Providence, that we might see in him how much it is possible for man to know."

This ideal circumscription of the human capacity was not the most favourable condition in which to stimulate the spirit of unconstrained inquiry; and to it, more reasonably perhaps than to any other circumstance, may be assigned the curious fact that, during the dark ages, few historical records were made of the nature of the prevailing diseases.* We know that many epidemic and pestilential diseases *did* occur; but whenever they are mentioned, all details relative to their character, or the mortality which they occasioned, are neglected. We only learn that they were generally ascribed to the Jews and Saracens, and that summary vengeance was often taken on the innocent victims. Nor is this to be wondered at in the gloomy and barbarous period of the world's history which we are contemplating; for even at the present day, on the appearance of such diseases, there is usually some excess of alarm, and often some popular delusion, less imaginary perhaps but equally mistaken.

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* Webster, vol. i. p. 193.

In the thirteenth century the Caliph Mostanser re-established the academy and medical college at Bagdad; for both had fallen into decay, and had been replaced by Jewish seminaries. He gave large salaries to the professors; he collected a magnificent library, and established a new school of pharmacy *; but to little purpose; for no successful researches, no new ideas, no great and important truths, resulted from this, nor from the celebrated school of medicine which existed at Damascus at the same period. A slight impulse, however, in the right direction was given by Albucasis, one of the most, if not the most, eminent of the Arabian surgeons. His medical practice he founded entirely on the doctrines of Rhazes and Paulus Ægineta; but in surgery he appears to have surpassed all other Saracens. He wrote a description of the surgical instruments then in use, and the method of using them; not even omitting, as Avenzoar had done before him, those for lithotomy; and reproved his fellow-surgeons for daring to operate without an adequate knowledge of anatomy: whence it would seem, that he himself possessed that knowledge, but how he acquired it does not appear.

It is not to be supposed that mention has been made of one-tenth part of the Saracenic authors whose names have been transmitted to us †; but the distinguished few so completely stamped the impress of their own peculiar genius on the school generally, and were so reflected by the numerous satellites who revolved around them, that it would be useless as well as tedious

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* Thomson's History of Chemistry, vol. i. p. 112.

† Abi-Osbaia wrote biographical sketches of more than three hundred Arabic medical authors, of whom forty-six were translators.

to impose a greater number on the attention of the reader.

What the state of medicine might have been if the Arabs, instead of copying, had emulated the Greeks in independent research, it is impossible to say; for they appear to have had the ability to advance, if their religion and laws had not opposed an effective barrier to improvement.

In one branch of medical science they may have progressed a step beyond their Greek masters; but even in that the reader may be disposed to think that their labours have been overrated.

The name of Geber has been incidentally noticed; but as he was neither an Arab nor a physician, and simply wrote on alchemy in Arabic, we need not dwell upon his name here. We are bound, however, to refer to the probability that many improvements in chemistry were due to those physicians who filled the chairs in the medical schools under the Caliphs; on which subject Dr. Thomson has observed, that, "As no notice of chemical processes which have come down to us is made by any of the Greek or Roman writers, and as we find them minutely described by the earliest chemical writers among the Arabians, we have no other alternative than to admit that they originated in the East."* But the random manipulations which were then practised were very different things from the systematic experiments of the present day; nor do the Arabians appear to have made those discoveries in chemistry which would justify the praise which has been lavished on them. Having carefully perused the very best authority on the subject[*], one is induced to think that they merely transmitted to modern times the knowledge of those substances which had previously been observed and described; for among them there is not a metal or mineral which was not known before; and of gases there is not a single one respecting which they had any accurate notions.

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* Thomson's Hist. of Chem. vol. i. p. 123.

Arsenic, tin, lead, iron, copper, mercury, silver, and gold, as well as the compound metals, brass and bronze, were all known from the earliest times; and the four elements, as they were called, although of all inorganic bodies the most complex, were still regarded as elements. Their intercourse with other Oriental nations was, as we have already seen, the means whereby they have the credit of having added many medicinal agents to the Materia Medica; and with respect to writing-paper (the manufacture of which, however, is not strictly speaking a chemical process) which, it is said, they introduced into Europe in the seventh century, it is well known that the art of making it from fibrous materials, reduced to a pulp in water, was practised by the Chinese as early as the first century. There is reason to suppose that they were acquainted with sulphuric acid; and nitric acid they obtained by heating a mixture of saltpetre and clay; they probably knew alum also; but there is no satisfactory record of their having discovered either.

The carbonates of soda and potash they made; but they confounded the two under the common name alkali—a name, undoubtedly, of Arabic origin, and so far evidence of Arabic discovery; but it was not until

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[*] Handbook of Chemistry, by Leopold Gmelin, translated by Henry Watts, B.A., for the Cavendish Society.

1736 that Duhamel showed the distinction between the two.*

They were familiar with sulphur and lime, and probably with manganese, as a decolourising agent in the manufacture of glass; they also possessed the knowledge of cinnabar and cobalt as pigments, and Gmelin concedes to them the honour of having added corrosive sublimate to the list of medicines. But, according freely to them this and every other specific discovery which has been claimed for them, how unfruitful was their empire during a period of 800 years! And how infinitely thankful should we be for the immutable truths of modern chemistry, the insight which it gives into the operations of nature, the doubts which it dispels, and the aspirations which it induces after higher generalisations! There were, unquestionably, men of talent amongst the Arabic physicians—men whose acquirements gained for them the highest honours which the Caliphs could bestow; but they never elevated themselves beyond imitators: in proof of which, with the doubtful exception in favour of Rhazes, we find no important discovery attached to a single name of all the Saracenic medical celebrities.

In 1258, when Bagdad was taken, Arabic learning ceased in Asia Minor; it gradually declined in Europe also, until the Saracens were driven from France and Spain. The school of Granada held out the longest; "not in consequence of a more righteous rule, for all the vices of the Mohammedan constitution were as prominent there as they had been in the East; but, being surrounded by enemies, the Spanish Arabs were more watchful, and, consequently, more vigorous than those of the East."* Finally, in 1491, when Ferdinand invested Granada, after a siege of nearly a year, the standard of the Cross waved from the towers of the Alhambra, and thus ceased the Arabic school of medicine; but not so its influence, as we shall have abundant evidence to show.

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* Gmelin's Handbook.

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* Penny Cyclopædia, art. "Moors."

CHAP. VI.

PROGRESS OF MEDICINE, AND ITS VICISSITUDES, FROM THE SEVENTH TO THE FIFTEENTH CENTURY.

When the medical school of Alexandria was destroyed by the Saracens, as if to demonstrate the correlation of science with the instability of empires, a sudden interruption appeared in the list of Greek authors; and for a period of nearly 500 years, scarcely a Christian physician of any repute was celebrated or even heard of.

It may be interesting, however, to revert to the time when Paulus Ægineta was compiling into his seven books the medical knowledge which had been accumulated by the Greeks and Romans, if it be only for the purpose of indulging in the sentiment which always attaches to the study of one's own country, even when we are obliged to regard it in the light of one inferior among nations. But the Anglo-Saxon was by no means the rude and barbarous individual which he is too often represented to have been, although he was unlearned himself and an enemy to learning in others. He was fond of poetry, and took delight in the recital of romantic exploits in love and warfare; and where shall we find two stronger incitements to the practice of the art of healing? Now that we can look down from the height of an enlarged and philosophic experience, we may be justly proud of our course, slow though it may have been, but effected by the steady patience and perseverance, pushed on to genius, which has made us what we are—the most healthful, progressive race in the whole world—in spite of the many opposing circumstances which suggest themselves to every reflecting mind.

We are informed by the early English chroniclers, especially by Strutt, that when Theodore, Archbishop of Canterbury, came over to Britain in the year 669, accompanied by a monk named Adrian, he contributed greatly to the instruction of the people.*

They brought with them a large quantity of manuscripts, from which they read lectures on arithmetic, poetry, astronomy, and divinity, as well as on the preservation of health and the knowledge and application of medicine; but the doctrines they propounded were strongly spiced with the superstition of astrology; for, in one of his lectures, Theodore lays down the maxim, "that it is very dangerous to let blood on the fourth day of the moon, because both the light of the moon and the tides are upon the increase." † Medicine then consisted, in this country at least, of a few nostrums, which had been handed down from one generation to another, in the administration of which many whimsical rites and ceremonies were observed; and to these ceremonies the success was often in a great measure attributed. The practice of the profession was in the hands of the most ignorant people, particularly of old women, who were supposed to be most expert in applying remedies for diseases; and, accordingly, they were in high repute amongst the Anglo-Saxons. But after the establishment of Christianity, the clergy took upon themselves the profession of medicine, and the reputation of the old medicinal women gradually decayed. Nevertheless, there is good reason to suppose that the clergy were not less superstitious in the application of their remedies than their venerable predecessors, seeing that they carefully observed certain times and seasons, which were esteemed either fortunate or unfortunate; the changes of the moon or the appearances of the planets being matters of the greatest moment when any medicine was to be administered or the patient bled.* We may be morally sure that this period of implicit faith in supernatural events was perpetuated by reason of the universal ignorance which then prevailed respecting the uniformity in the course of nature; so that many of nature's laws were unknown, and therefore disregarded. And this ignorance was not so much attributable to an absolute carelessness for learning, as to the scarcity and exorbitant price of books, making it impossible for any but kings or bishops to obtain them. An anecdote illustrative of this state of things is recorded of Alfred, King of Northumberland, who, in 690, was obliged to give an estate of eight hides of land to Benedict, Abbot of Weremouth, for the purchase of one book on Cosmography.†

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* The Chronicle of England, by Joseph Strutt, vol. i. p. 345.

† Beda, S. Ven. Historiæ Ecclesiasticæ Gentis Anglorum, lib. v. cap. 3.

By such glimpses as these into the difficulties which encompassed our Anglo-Saxon ancestors in the acquisition of knowledge, we can well understand how it was that so little and such slow progress was made; and, by the support or discouragement which monarchs gave to literature, we may understand also, the oscillation of opinion which was entertained respecting it; how, in fact, it was advanced or retarded both in England and in Germany, where the ancient Danes were very much in the same condition as the Anglo-Saxons.

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* Strutt's Chronicle of England, vol. ii. p. 248.

† A Compleat View of the Manners, Customs, Arms, Habits, &c. of the Inhabitants of England, from the Arrival of the Saxons till the Reign of Henry the Eighth, by Joseph Strutt, vol. i. p. 72.

Another, and still greater obstacle to learning arose from the very frequent invasions of barbarous tribes over Christendom generally; but now and then a man appeared who showed some flickerings of ancient illumination. Thus, Theophilus, who was surnamed Protospatarius, whom we have already had occasion to quote, lived at the latter part of the eighth century. He was a Christian writer, and probably a monk. He wrote an excellent abridgment of Galen's works; and Portal attributes to him the merit of having been the first to discover the olfactory nerves, which, as we shall hereafter see, is more than doubtful. He did, however, describe the muscular structure of the tongue, and the minute vascular character of the testes in man.*

A great promoter of learning in the ninth century was our own Alfred, surnamed the Great, who delighted in poetry, and also translated many useful works into Saxon, of which "he caused numerous copies to be made, that they might be sent to certain of his bishops, to whom they were very needful, they not understanding the Latin speech." "After Alfred had set the example, many medicinal works were translated into the Saxon tongue, copies of some of which are at this day remaining. One of them, embellished with delineations of a variety of herbs, not ill done for the time, which, as near as can be judged from the handwriting, appears to have been during the tenth century,"* shows that they possessed some knowledge of botany.

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* Portal's History, vol. i. p. 129.

† Strutt's Manners, Customs, &c. vol. i. p. 72.

When Alfred died, learning declined; and the subsequent invasion of the Danes, who were professed enemies to all sciences, occasioned its falling off again in England; but at Constantinople a Greek physician, named Actuarius, flourished, according to Justus Wolfgang, about the eleventh century, who wrote a work on Therapeutics, in six books, for the use of an ambassador in the north.† The name of Actuarius applied itself generally to the titular physicians of the court of Constantinople; but it was more particularly applied to John, the son of Zacharias, the subject of our present consideration.

Next to Actuarius, Nicolas Myrepsus may be mentioned as perhaps the last Greek physician who studied at Alexandria. He wrote a description of all medicinal appliances then known, and the peculiar uses to which they were applied. For surgical applications he describes plasters, ointments, cerates, and cataplasms. As might be expected from the multiplicity of remedies which the Saracens possessed, both Actuarius and Myrepsus borrowed largely from them, as they themselves before had done from the Greeks.

With the eleventh century a curiosity was engendered respecting Greek learning, especially as it concerned medicine and the investigation of the physical powers of nature. Then it was that many curious and inquisitive spirits of Europe had recourse to the East, as a source of such information as they found themselves deficient in; and from such an expedition a band of forty Norman pilgrims landed at Salerno, in Italy, where, it is said, a school of medicine had been established as early as the seventh century by the Benedictine monks, for the purpose of teaching the art in Hebrew, Greek, Arabic, and Latin. It was stinted in its growth, however, by the prevailing superstitions; and hence, perhaps, the reason why so few living monuments of its reputation are heard of. The pilgrims in question have the credit of having delivered the city from the Saracens, and of imparting to its school a more healthy spirit of inquiry than had been previously pursued. The dignitaries of the Roman Church were illiterate and fanatical to the last degree. Those zealous professors of medicine, who, Sisyphus-like, had succeeded in raising their science to the rank of respectability, had no sooner accomplished their task, than backward it fell by the evil influence of those who should have sustained it, making the fruitless labour appear to be eternal. Michel II., for instance, was an inveterate enemy of learning, and, true to his bigotry, boldly prohibited the instruction of youth. Sorcery appears to have been extensively practised by some of the highest dignitaries of the church, and five or six popes in succession were notorious for these sacrilegious rites. The Cardinal Benno has catalogued the ecclesiastical sorcerers of the period, and refers to Benedict IX., John XX., and the sixth and seventh Gregories as the chief. The papal chair was then at its lowest state of degradation; its tiara was repeatedly exposed for sale, and the reign of Gerbert is the only redeeming feature of the age in which he lived.

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* The Chronicle of England, by J. Strutt, vol. ii. pp. 248, 249. This MS. is in the Cotton Library of the British Museum, marked "Vitellius."

† Biographie Universelle, art. "Actuarius."

It is not very probable that the subordinates were accomplished scholars when their superiors were so deficient in learning; and as those subordinates were the only Christian practitioners of medicine, the art was not in the most favourable condition to be advanced. Thus it was that every department of science was neglected by the Christians, and medicine so constantly fell back into the lowest state of degradation. Fanatical monks, like the Asclepiades in the temples of Æsculapius, pretended to cure by means of prayer and incantations, and assumed to themselves the characters of divine agents if recovery ensued; but if otherwise, the disease was pronounced to be a test of patience in the good, or a retribution for evil doings in the wicked.

That public opinion did not run high in relation to medical practitioners in this state of things we may readily conceive; and we are assured of it by the laws of Theodoric, king of the Vesigoths, which, as we are informed by Lindenbrog, were in operation till the eleventh century.*

By those laws no practitioner was allowed to bleed a free woman or girl, unless either a relative or servant were present at the operation. On being called to dress a wound or treat a disease, every practitioner was bound to agree as to the amount to be paid for his attendance, which amount he forfeited if his patient died. It was moreover enacted, that if after an operation a gentleman should die, the surgeon who performed the operation should be delivered over to the surviving friends, to be dealt with as they might think fit; but if the patient were a slave, the surgeon should compensate the owner by supplying another slave. It is impossible to conceive a more telling picture of the low estate to which our noble profession was then reduced, nor one which could more effectually reconcile us to the dogmatical sway of the Arabic school, which had, at least, the merit of preserving and transmitting the writings of the Greeks.

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* Lindenbrogius (E.), Scriptores Rerum Germanicarum Septentrionalium. Hist. Eccles.

Before we proceed further with the history of Salerno, it is necessary to inform ourselves of the favourable circumstances which contributed to its advance, as well as the unfavourable, which retarded its progress, and of which mention has been made. This involves the consideration of a subject which was about as great a delusion as ever held the mind of man in bondage, although a certain amount of good came out of it.

It is said, but perhaps without sufficient evidence, that chemistry, as a distinct pursuit, originated with the Arabians, and by them was made subservient to the purposes of medicine. Now it may be difficult to trace back, in successive links of one continuous chain, the alchemy of the Middle Ages to the hermetic art of the ancient Egyptians; but the theory of the ancient Greeks, which Hippocrates first enunciated, that man and animals were constituted of the four elements, fire, air, earth, and water, was so obviously the result of a rude chemical manipulation, that it is, to my mind, a strong testimony of a certain amount of chemical knowledge, although of a fallacious kind. The theory may excite a smile now; but it must be remembered that they knew nothing of the elementary gases, and that what they considered to be elementary bodies were not so:

consequently, on exposing animal tissues to heat, they evaporated the fluid part, or water, which, as they thought, was changed into vapour or air. Inflammable gases may also have been formed in the process, and so the element fire was inferred, whilst all that remained was a solid matter, which they conceived to be earth. Again, in boiling water, they observed that it was dissipated into vapour, and left behind a calcareous crust on the vessel in which it was boiled; hence they inferred that water was changed into air and earth. But the system of metallurgy pursued by the Phœnicians and Egyptians before them, affords a proof that the foundations of chemistry, as applied to the arts and medicine, were laid long antecedent to the time of the alchemists of the Middle Ages.

Some learned antiquarians have supposed that Cadmus, a Phœnician, taught the Greeks the art of extracting metals from their ores, and that *Cadmia fossilis*, as the common ore of zinc was formerly designated, was so named in honour of him. The pure metal zinc was not known to the ancients, nor until the time of Paracelsus, who is the first to mention it*; but the ore called calamine, or cadmia, the ancient Greeks used in the manufacture of brass; and the oxyde of zinc, which was volatilised in the process, was used for some diseases of the eyes; so that we have here an oxyde of a metal produced artificially, and applied to medicinal purposes.

From the most remote periods, gold, silver, and copper have been used for coins; and in the time of Galen, when silver was scarce, he proposed the substitution of bronze, which was adopted. The coinage of false money was also practised among the Greeks, and assayers were employed to detect the fraud; hence it is reasonable to suppose chemical operations were conducted at a time much anterior to the Arabian dominion in Europe.

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* Gmelin's Handbook of Chemistry; see "Zinc."

In the Bibliothèque Impériale at Paris, many documents and drawings of apparatus are preserved, showing the metallurgic manipulations of the Greeks, from which it may be seen that the operations of distillation, sublimation, and cupellation, were practised by means of retorts and receivers, crucibles, and other vessels, which were used by chemists up to the end of the eighteenth century, and even later. Though the subject of metallurgy does not properly come within the scope of this work, yet it led so directly to the theory and practice of the alchemist, which do, that I cannot pass it over unnoticed; but I will confine myself to that which had an obvious bearing on attempts to effect the transmutation of metals, to which we are, doubtless, indebted for many remedies, as well as for the more rational system of pharmaceutical chemistry. From the Greeks, the Romans derived their knowledge of metallurgy, and advanced it greatly; for Pliny informs us that they obtained gold by amalgamating the ore with mercury; that they separated the silver, which is generally found associated with gold, by means of common salt; that they purified silver from lead by converting the latter into an oxyde, although they knew it not as such; and that, by some curious chance, they used common salt and nitre as a solvent for gold.

The Greeks and Latins of old were, doubtless, observant of the changes which these strictly chemical operations effected in the metals, and were not ignorant that nature herself abounds in apparent transmutations.

In the mineral, vegetable, and animal kingdoms they saw changes constantly going on; and when such as I have enumerated among the metals were practicable by art—when, moreover, in fusing argentiferous lead, and observing, after the oxydation of the baser metal, a button of silver remaining behind—what was more natural to a highly speculative mind, not conversant with all the conditions, and in an art pregnant above all others in marvellous phenomena, than the belief in the transmutation of lead into silver? And if one metal were convertible into another, why might not other instances occur? Why might not such transmutation go on to gold itself, or even, perhaps, to something more precious still? Such, in fact, was the famous doctrine which originated with Geber, a Greek speculative philosopher, who wrote in Arabic during the eighth century. To the theory of transmutation he superadded the hypothetical existence of an elixir vitæ, or philosopher's stone; but as to what that stone precisely was, few, if any, of his followers were agreed. Its virtues, however, were supposed to consist in the conversion of all it touched into gold, and in securing supreme happiness, perfect health, and indefinite duration of life, to all who might be fortunate enough to possess it.

As a system, or delusion, it beguiled men's minds from the eighth to the seventeenth century, during which period it numbered amongst its most illustrious adepts, as those most skilled in the subject were denominated, Geber, its founder, Albert Groot, Raymond Lully, Arnoldus de Villa Nova, Roger Bacon, Nicolas Flammel, Paracelsus, Cremer, an abbot of Westminster, Basil Valentine, Dr. Salmon, and last, though not least, Peter Woulfe, a Fellow of the Royal Society, who died in the beginning of the present century. From these, the highest types, and not from the impostors who practised the art as a means to abuse the credulity of mankind, are we bound to form an estimate of the alchemists.

They were patient and assiduous workmen, but blind to the uniformities which exist in nature; ignorant of the laws of causation, which determined the class of phenomena they were engaged in producing; unskilled in the rules of experimental enquiry; and, therefore, they committed all their experiments to blind chance, torturing every natural object with which they were acquainted, in the hope that something good might turn up; and occasionally they were rewarded by the discovery of some new substance with which they were not before acquainted; but it was, from beginning to end, a work of chance.

These transcendental researches for the acquisition of a substance which should have the power of dissolving all bodies, of converting all metals into gold, and of giving health, together with an indefinite prolongation of life, failing, as of course they did, in their professed objects, yet led to the discovery of many most important chemical compounds, as well as of many most valuable medicinal agents.

But the progress of chemical science was in no degree advanced, although it is greatly indebted to the alchemy of the Middle Ages for the familiarity which it engendered with many natural substances, or still more for the insight which it gave into their composition.

The honest enthusiasts, who were firm believers in the possibility of transmuting metals—pure alchemists in fact, suffered in reputation by the fraudulent practices of unscrupulous quacks and impostors. Some of these were exposed by M. Geoffroy in the "Memoirs of the Academy of Science," in 1772, wherein he shows, what has been known in all ages of the world, that the difficulties which appear insurmountable to men accustomed to weigh the consequences of their actions, vanish before the recklessness of those who have no characters to lose. Instead of the mineral substances which they pretended to transmute, they put oxyde of gold or silver at the bottom of the crucible, and gum-water or wax so coloured that it might look like the bottom of the vessel. On other occasions they made holes in charcoal, filled them with granulated gold or silver, and closed the holes with blackened wax ; or they soaked charcoal in a solution of these metals, and then threw the charcoal, when powdered, upon the material to be transmuted. They used also pieces of wood hollowed at the end, put filings of gold or silver into the cavity, and stopped it with sawdust and gum, which, on burning, left the metal in the crucible. Sometimes they whitened gold with mercury, and so made it pass for silver ; and the gold, when melted, was exhibited as gold obtained by an act of transmutation : or they had a solution of nitrate of silver or muriate of gold, or an amalgam of gold and silver, which they adroitly introduced into the crucible, and so furnished the necessary quantity of metal to display.

The temptation was great, and the facility perhaps greater, to exercise the above frauds, especially in the twelfth century, when every tale of wonder was sure of a favourable reception, when relics and miracles were most sought after, and when astrology and the occult art were the favourite pursuits of the regular physician. Can we wonder, then, that a class of men should have arisen to traffic on the ignorance and credulity of their fellow-creatures? But everything has its good as well as bad side, and to exhibit one only is to misrepresent; we are therefore bound to form our estimate of alchemy from such men as Albertus Magnus, Bacon, and Valentine, whose scientific acquirements were undoubtedly great, although they were deeply imbued with the belief in the philosopher's stone.

Raymond Lully obtained nitric acid by accidentally distilling a mixture of nitrate of potash and sulphate of iron. Basil Valentine paid special attention to antimony, and produced many of its compounds which are now used in medicine; he also first described sulphuric and muriatic acids, and gave directions for preparing them; and, more lately, Brandt, of Hamburg, whilst searching for the ideal elixir vitæ, discovered phosphorus, which he first procured from urine; he also first extracted the metal cobalt from its ore. Other chemical compounds are spoken of as having been originally produced by the alchemists, such as calomel, nitrate of silver, fulminating gold, &c.* But knowledge is sometimes as dangerous as it is exalting to those who may happen to possess it; and thus it was with both Arnold and Bacon, who, after astonishing the weak minds of their neighbours, were not altogether free from the jeopardy of immolation, in consequence of the suspicions of witchcraft which both brought on themselves by their experiments, and for which they were imprisoned, and narrowly escaped starvation, or being burned as magicians.

In 1760 Lavoisier first used the balance, by which instrument chemistry was at once elevated as a regular branch of natural science, and alchemy received its death-blow.

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* Gmelin's Handbook of Chemistry.

This episode in medicine gave a great addition to the catalogue of remedies, and increased the amount of labour and skill necessary for the preparation of them by the processes of distillation, sublimation, and other chemical operations.

The Materia Medica was previously made up, almost exclusively, of vegetables, which, until the time of Galen, physicians were in the habit of collecting and preparing for themselves. Eventually, however, they employed others to collect them, who by degrees acquired a knowledge of the virtues of their commodities, and sold them as secret medicines. But, as these plants were not always harmless, Pliny rebuked the physicians of his day for trusting to others a duty which they ought to perform for themselves; and, as accidents were sometimes occasioned by the ignorant administration of medicinal remedies, a law was enacted, which established a punishment for such as sold to any one a poison by mistake.

These dealers in herbs kept a store or shop, called Apotheca*, which, by a gradual corruption, was converted into the modern Italian, *boteca*, and French, *boutique*. The keeper of the Apotheca was called Apothecarius, who was, of course, a very different style of man from the apothecary of the present day. It is probable that the physicians, finding an apothecarius in whom they could confide, employed him; and in this manner, Conring informs us that in the eleventh century Avenzoar, and other Arabic physicians, consigned the preparation of their medicines to such ingenious men. This increase of labour, as well as the habit of mixing simples which had gradually crept in, necessitated the employment of apothecaries in the composition of medicines*; for we read in the fifth book of Celsus, as well as in Paulus Ægineta, of many compounds; and in the "Antidotarium,"† or Book of Receipts, which the physicians caused to be collected and translated into Latin, we have the forms which the compounders were sworn on their oath to observe; that they would, in short, make up their potions, electuaries, syrups, trochisks, and all other medicines, "*secundum prædictam formam*," and keep by them fresh and sufficient drugs to make up medicines exactly according to the prescriptions of the physicians. This latter clause also implies the existence of a practice, which appears to have originated with the Arabic physicians, of writing a prescription at each visit to their patients.‡

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* Thomson's History of Chemistry, vol. i. p. 112.

And now to resume the history of the school of Salerno, whose early annals were by no means encouraging. It may be observed, that the successive ravages of the Saracens and Huns, by which Italy was so incessantly convulsed and agitated, were by no means the most favourable circumstances for the maintenance even of the languishing state of the arts and sciences, as they existed in the seventh century; and yet a faint revival did occur in medical literature, in consequence of the retrospective enquiries of the Arabs, whose peculiar appetite for knowledge rather encouraged the Benedictine monks of Salerno to continue their study and practice of medicine, wherein they derived their information partly from the Mahommedans, and partly from the more distant, as well as more ancient seats of Arabian learning. But the distractions to which their country was a prey caused the period of Arabic supremacy to be regarded as the darkest of mediæval night; and the superstition of the age connected the overwhelming inroad of barbarians with the consummation of all things, and the final judgment.* In accordance with such notions, prayers and mysterious rites prevailed, both at Salerno and Monte Cassino, where the Benedictine monks had established another school, and where Henry II. of Bavaria was said to have been miraculously cured of a grave distemper (stone), by St. Benedict. One proof amongst many of the miserable condition into which the practice of medicine had fallen, was the influence acquired by the Jews, who were hated and persecuted in all other grades of life except as physicians, and in that one they were popular.†

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* Beckmann's Hist. of Inventions, art. "Apothecaries."

† This Book of Receipts was collected chiefly from the works of Arabian physicians, Mesues, Avicenna, Actuarius, Nicolaus Myrepsus, as well as from Galen. *Vide* Beckmann.

‡ Beckmann, art. "Apothecaries;" see also Dr. Henry's History of England, vol. vi. p. 115.

During the eleventh century, Salerno acquired universal celebrity, partly perhaps from its local situation as a great outlet, by which the crusaders passed in their expeditions from Europe to Palestine, and partly also from the special attention which was given to medicine.

This was the first school in which regular medical diplomas were granted to candidates after they had passed through a prescribed course of study, and had undergone an examination, as a necessary qualification to practise. This famous enactment was instituted by Frederick II. of Naples*, for the purpose of protecting his people against the flagrant impositions which were practised on them by impudent quacks; whilst the neglect of apothecaries was guarded against by the appointment of a physician to inspect shops where drugs were sold.† But the law had more especial reference to the higher grades of the profession; for it was ordained that no surgeon was to undertake a surgical operation without a previous knowledge of anatomy; for the acquisition of which facilities were given by the institution of a professor's chair, from which the structure of the body was to be demonstrated once during every five years.

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* Encyclopædia Metropolitana, "Hist. and Biog." vol. ii. p. 348.

† Revue des deux Mondes, art. "Vicissitudes et Progrès de la Médecine." Nov. 1859.

The enactment in question was the means of introducing a more scientific way of teaching and studying the art of healing than had been previously adopted; and it is probable also that it established a specific distinction between physicians and surgeons; for at a somewhat later period (1199) a contemporary poet, in describing the attempts which were made to cure the wound which Richard I. received before the Castle of Chalus, plainly distinguishes between the two, and the different parts they performed on that occasion.‡

There is good reason to infer that physicians in those days were not entirely above the suspicion of venality; for every claimant of a diploma was made to swear that he would take no fees from the poor, nor have any share in the gains of apothecaries. A book was then put into his hands, a ring upon his finger, and a crown of laurel upon his head, when he was dismissed with a kiss from the learned doctors.

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* Beckmann, art. "Apothecaries."

† Ibid.

‡ "Interea regem circumstant undique mixtim,
Apponunt Medici fomenta, secantque Chirurgi
Vulnus, ut inde trahant ferrum leviore periculo."
Pasquier, *Recherches*, b. ix. c. 31.

Such was the ordeal through which the first graduates of medicine had to pass; but, for some time, they relied chiefly on the relics of St. Matthew, which were preserved in Salerno, as a means of curing their patients; and so exclusively were the sick in the hands of the Benedictines, who greatly retarded the course of a more enlightened system by their superstitious observances, that a mediæval writer, in a spirit of refined but bitter irony, bewailed the fact as a stratagem of the devil to supplant religion, by drawing the holy Fathers out of their convents under the pretence of ministering to their Christian brethren in disease. Eventually, however, the monks turned their attention to nature, and very soon discovered that they cured more diseases without the assistance of the relics, than they had before done with them, and from that time they acquired a world-wide reputation. It may indeed be said of the school of Salerno, in relation to medicine, as it has been said of Italy, in relation to literature, science, and the arts generally, that "it supplied the fire from which the other nations lit their torches;"* but the first impulse was not given by the clergy, for the degeneracy of that order had reached its lowest depth when the dawn of fame had begun to break over Salerno as a medical school; nor was its renown due to the teachers only, but to those who sprang out of it, sustained its discipline throughout the period of the most profound ignorance, and extended that teaching to other universities, yet whose names are forgotten in the lapse of time. If any one person may be mentioned, however, the name of Constantine the African, as he was called, because of his native place, Carthage, is entitled to that honour. In spite of the conflicting opinions concerning him, he is admitted by all competent judges to have been one of the most celebrated men of the eleventh century. The Corypheus of the monastery, as of the medical school, he was intent on acquiring information himself, and on imparting it to others. He studied the sciences with great assiduity, as well as the necromancy of the Chaldeans, for which purpose he repaired to Babylon and to India, and returned to Carthage, where he so perplexed the minds of his countrymen, that they regarded him as a magician, and persecuted him accordingly. To escape from their violence, he went to Salerno, disguised as a mendicant, and was there recognised by the brother of the king of Babylon, who recommended him to Robert Duke of Normandy, as a secretary. He also acquired the friendship of the Abbot Didier, of Monte Cassino, who became Pope Victor III., by whose influence, together with that of Robert, he obtained great patronage for the school of Salerno. He translated the works of Hippocrates and Galen into Latin; and if, as many say, he was a mere compiler, he was a man of great erudition; for he introduced the Arabic, as well as the Greek system of medicine into Italy, and gave a great impulse to the study of both, when learning was so much neglected.

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* Hallam's Lit. Hist. vol. i. p. 74.

It was in the eleventh century that the art of making paper from linen was introduced by the Saracens into Europe, by which means the number of manuscripts was very greatly increased, and the study of medicine, as well as of the sciences generally, very much facilitated.*

On his return from the Holy Land, Duke Robert remained some time at Salerno, to consult the physicians respecting a wound in his arm, which had become fistulous, in consequence, as it was supposed, of its having been inflicted by a poisoned arrow. Suction of the wound was recommended, to which Robert would not consent, lest the person sucking it should be poisoned; but his wife, Sybil, contrived to do it in the night, during his sleep, and the wound healed.

Sybil was not the only lady practitioner of Salerno; for it is a remarkable fact connected with the early history of that college, that females were admitted as students in medicine; and some few distinguished themselves by their writings. Professor Haeser, of Greifswald, records the names of five of these ladies, one of whom, Constantia Calenda, achieved a high reputation in her time; and if the monastic character of the institution suggests many difficulties, these, by the judicious management of those inhabitants who had the jurisdiction of the college, and interested themselves greatly in its welfare, were effectually overcome. To this end, among other things, it was enjoined that the director should be married, and exercise a paternal supervision over the female aspirants.†

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* Amoreux, p. 257.

† Lehrbuch der Geschichte der Medicin, von Dr. H. Haeser, p. 290. The authoresses named by Professor Haeser are Abella, Mercuriadis, Rebecca, Trotta, and Constantia Calenda, who was the most celebrated of them all. None of these, however, are mentioned

The school of Salerno continued to flourish up to the fourteenth century, and many royal individuals studied medicine there; among others were Roger, king of Sicily, and his successors, William I. and II. It was, moreover, spoken of by the truthful Rabbi, Benjamin of Tuleda, as the best medical school then in existence; and the good old Orderic Vital, in his "Histoire de Normandie," accords a like character to it. A celebrated work, written in Latin verses, entitled "Regimen sanitatis Salerni," was generally supposed to be the joint production of the physicians of Salerno; it appeared in the eleventh century; but Haller attributes it to a single author, John of Milan. Its chief merit is that of giving a comprehensive notion of medicine as it then existed, more especially of the remedial agents in use; but as the Arabian, Ebn Baithar, had just before written a great book, wherein he described upwards of 1400 medicinal and dietetical articles, the great curiosity of the "Regimen sanitatis Salerni" consists in the versification on so uninspiring a subject. Had the professors of Salerno devoted themselves with as much zeal to the old Greek authors as they did to the Latin translations of the Arabian commentaries on them, how different might have been the fate of their school! which eventually ended in the same nothingness as did the men who emanated from it.

And there was no lack of incentive to exertion; for the crusaders, with the pious intention of protecting the Christians in the East, spread the diseases of the Holy Land over western Europe. The same leprosy

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in the "Dissertatio Historico-Critica de Feminis ex Arte Medicâ Claris," by Polycarpus Fridericus Schacker and Joannes Henricus Schmidius.

which Pompey first introduced into Italy was renewed by these religious expeditions in the twelfth century with intense virulence*; and another form of leprosy, which is supposed to have originated with the Arabs, was superadded to the above, as well as to small-pox and measles.† So greatly were these evils felt, that many righteous men, who first went out to propagate their faith, were set apart on their return to superintend the hospitals; and the Knights of St. John of Jerusalem were accordingly decorated with the same white dresses as were worn by the Asclepiades in the temples of Æsculapius, as symbols of their holy calling.

Another enormous delusion took its rise, as we are informed by Hume‡, in the eleventh century, and was first practised, according to that authority, by Edward the Confessor. The generally entertained opinion of his sanctity nurtured the belief in a power which he was thought to possess—of curing scrofula by the simple act of touching the afflicted; and his successors regarded it as a part of their state and grandeur to uphold the same opinion. The ceremony has been continued down to our own time, until the present Royal Family, observing that it rather excited ridicule than reverence in the eyes of all men of understanding, wisely gave it up.

It is impossible to read of the many acts of miraculous cure which have been recorded even in these pages, without asking oneself the question, "Did faith in the efficacy of the Royal touch for the cure of disease originate with Edward the Confessor, or did it date as far, or even farther, back in time than Hadrian, who, as we have seen, was reputed to have restored sight to the blind by the simple imposition of hands?"* I am disposed to think that the latter is the real state of the case; for in "An Inquiry into the Antiquity of Touching for the Cure of the King's Evil," by one William Beckett, who was evidently a sceptic, there is a letter from a friend, who writes from Rome in 1721, after witnessing many miracles which had been done by the Pope, giving an account of his investigations relative to the ceremony of cure by the imposition of hands; and he arrives at the conclusion that King Pyrrhus cured diseases by merely touching with his finger; that Vespasian cured two persons by simply touching them; that Mahomet cured a great number by touch; and that Valentius and Heracleon, Apelles and Severus, Tatianus and Montanus, all pretended to the gift of healing by simply touching the diseased persons with their hands.

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* Encyclographie des Sciences Médicales, tom. xi. p. 118.

† This was the Elephantiasis Arabum. See Amoreux, p. 31.

‡ Hume's History of England; "Edward the Confessor."

John Brown, Chirurgeon in ordinary to His Majesty, King Charles II., wrote the "Charisma Basilicon, or the

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* Mr. Pettigrew, in his work, "On Superstitions connected with the History and Practice of Medicine," p. 118, observes that "the practice was one of English growth, commencing with Edward the Confessor, and descending only to foreign potentates who could show an alliance with the royal family of England. The kings of France, however, claimed the right to dispense the gift of healing, and it was certainly exercised by Philip I.; but the French historians say that he was deprived of the power on account of the irregularity of his life. Laurentius, first physician to Henry IV. of France, expressed his indignation at the attempt made to derive its origin from Edward the Confessor, and asserts that the power commenced with Clovis I. A.D. 481; and that Louis I. A.D. 814, added to the ceremonial of merely touching the sign of the cross."

Royal Gift of healing Strumaes, &c., by contact or imposition of hands," in 1684. He was either a firm believer in the supernatural gift, or a most finished courtier; for, after stating that he had known, to his entire satisfaction, many persons perfectly cured the first time they had been touched by his sacred majesty, whom he extols for his great charity, piety, clemency, and humility, as well as for his gracious favour and best wishes towards the recovery of those who came thus to be healed, he goes on to say, that the Apostles had the gift bestowed on them, and that their successors have been sharers therein with them; and that no age of Christianity hath ever been without it, although some ages have had it more frequently than others. He then quotes the opinion of Origen, who, on seeing the Divine power, said, "These miracles are to be examined by certain rules of judgment, lest they bring condemnation unto men, or correction to their manners: that we may distinguish between those done by the help of Satan, from those which are performed by a pure and pious mind, adorned with the Divine Spirit."

A Benedictine monk, named Jerome Porter, about 1720, writes thus: "This wonderful gift of curing the disease called Struma, now King's Evil, because it has been healed by kings, was derived from Edward the Confessor by all the kings of England, and remains as a holy inheritance to this day. The French derive it from St. Lewis." Philip I., however, was reputed to have acquired universal celebrity for this power before St. Louis. The miraculous gift has been recorded in different reigns, by John Brampton, R. Hovedine, Polydore Virgil, Nich. Harpsfield, and others. James I., with whom the same sanative power continued, cured the blind as well as the scrofulous; one Mr. Foster, of Windsor, having recovered his sight in fourteen days after being touched.

We have the authority of William of Malmesbury, who wrote about forty years after the death of Edward the Confessor, which was in 1066, relative to the supernatural power in question. He relates the case of a young woman, who had a husband about her own age, and, having no child, became ill with tumours in her neck. "She was commanded in a dream to apply to the king to wash it. To court she goes; and the king being at his devotions all alone, dip'd his fingers in water, and dabbel'd the woman's neck; and he had no sooner taken away his hand, but she found herself better, the loathsome scale dissolv'd, so that worms and purulent matter bursting out together, all the noxious humours disappeared; but the lips of the ulcers remained wide and offensive. She continued at court till she was well, which was in less than a week's time; the ulcers being so well closed, and the skin so fair, that nothing of her former disease could be discerned; and in a year's time she was brought to bed of twins." The above is reported by Beckett, who also relates, on the same authority, that "a blind man spread a report at court, that he should receive his sight if he touched his eyes with the water that the king had wash'd his hands in; which the king hearing of, disclaim'd any such power; but his servants, it seems, without the king's knowledge, while he was at prayers, made the experiment, and immediately after the blind man was wash'd with the water, he recover'd his sight." Edward was also said to have restored sight to a blind man at Lincoln.

The next is a subject for the imagination. "The same king carried a poor cripple upon his back, stock'd with a whole hospital of diseases, to St. Peter's church, Westminster, where he was immediately cured of his maladies." Such was the credulity of the age, that it would have been little less than heresy to have called in question the truth of all these things, and accordingly they have been transmitted as facts.

In the time of Charles II., the ceremony of touching was preceded by an examination and selection of cases by surgeons the country over, that none might approach his Majesty but such as were really afflicted with the evil, in testimony of which each candidate for the imposition of hands was furnished with a certificate, which also served the purpose of a precaution against cheating the king of a second piece of gold, "a trick studied by divers." Sundays and Good Fridays were chosen for the ceremony, when the chief officer of the yeoman of the guards placed the sick people in a convenient order for their approaching the king without trouble or noise. (At this part of the description in Browne's work, a plate is given, representing the king in his royal chair, at the end of a passage formed on each side by the yeoman of the guards, with their halberts; the surgeons conducting their patients up to the king, who is attended by the Clerk of the Closet, the then Bishop of Durham, and two chaplains.)

All being thus conveniently arranged, according to Browne, "his Majesty enters his royal chair uncovered, at whose beginning there are generally two chaplains attending; one of which, reading the ceremonies appointed for this service, his Majesty being all the while surrounded by his nobles, and many other spectators; the sick and diseased being kept back by the chirurgions till the appointed time; whereafter having made three obeisances, they do bring them up in order. The chief in waiting delivers them one by one to the king to be touched; the which done, the other takes him or her from him; and this method is used throughout the whole number which comes to be healed."

During, and after every act of healing, a chaplain read a portion of the 16th chapter of the Gospel of St. Mark, from the beginning of the 14th verse to the end of the 18th; and when all had been touched, the two following and last verses were read. "The which done," says Browne, "he begins the Gospel written in the 1st chapter of St. John, from the 1st to the end of the 8th verse. Here the chirurgions come up a second time, making their three obeisances as formerly, where the clerk of the closet on his knees doth deliver to his Majesty's sacred hand his gold ready strung upon a white silk ribbon; and when these following words come to be read, the king puts over the gold: 'That light was the true light, which lightneth every man which cometh into the world.' This running through the whole course of the ceremony, which words are continually repeated between every one which receives the gold. This being finish'd, these following words are read," (St. John's 1st chap. from the 10th to the 14th verse, both inclusive); "and in conclusion, a few special prayers were read, when, his Majesty having by my lord chamberlain, or in his absence the vice-chamberlain and two nobles brought up linen, and the bason and ewer to wash his hands, he takes leave of the people, and they joyfully and thankfully do return home, praying God and their good king."

Henry VII., was the first to introduce the ceremony of suspending a medal round the neck of each diseased person whom he touched; for the purpose, as Lord Bacon said, of rendering this method of cure the more efficacious. In the first instance this medal or gold, as it was called, was an angel noble, a current coin of the realm, made of the noblest and purest gold, and having an angel impressed on one side of it. In the reign of Elizabeth, who possessed the power of healing, although she had renounced the Catholic faith *, the rose noble of Edward III. was used, which had on one side the king's image in a ship, and the following inscription on the reverse, "Jesus autem transiens, per medium eorum ibat."

In later times gold, coined particularly for this purpose, was used, impressed with scriptural sentences; and so efficacious was the charm that Browne affirms of some who lost their gold, that their distempers *de novo* seized them again; "but upon gaining a second touch and new gold, their diseases have been seen utterly to have been chased away." The gold piece, which was strung upon white ribbon, must have been a considerable tax, for during twenty-one years, between 1660 and 1682, Charles II. touched 92,107 diseased persons, averaging about 4386 per annum.

The medal of James II. was struck in silver in Ireland, when it came to be called the touching or the healing-piece instead of "the gold."

Queen Anne touched Dr. Johnson for the complaint, and the Doctor left the touch-piece which the queen hung round his neck to Dr. Taylor, prebendary of Westminster: at his death he left it to the Duke of Devonshire. Faith in the delusion began to wax dim in the reign of the first George, for at that time Dr. Beckett wrote, "It's true, there have not been wanting persons among us, for some ages past, who have been unwilling to give an implicit consent to the current opinion of the times in which they lived, but suspected the veracity of it;" and he was bold enough to express his opinion that the cure was due chiefly to the great deference that is generally paid to the voice of the majority. Eventually Majesty itself felt that it could no longer inspire amazement, even to the populace; and being attended with ridicule in the eyes of all men of understanding, the ceremony was abandoned.*

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* Dr. William Tooker, a courtier of Queen Elizabeth's, in flattering her majesty on the sovereign power of curing the evil, traces the gift up to Lucius, who by some has been said to be the first of our Christian kings.

The school of medicine at Salerno, the self-styled Civitas Hippocraticæ, spread its influence over western Europe as early as the eleventh century, about which period many Italian scholars had established themselves in France, particularly in Normandy; and when William the Conqueror invaded England, he engaged a considerable number of learned men to settle in his new dominion.†

For a short period, whilst the arts and sciences seemed to revive on the continent, the Jews were the sole representatives of the learning of the Arabs, and shared its emoluments with the Christians; but literature generally, and medicine particularly, were more and more closely allied to the Christian religion; for the ecclesiastical schools and houses of the monastics were the sole depositories of learning, and in those places the candidates for priesthood were educated; medicine was generally taught under the denomination of Physics, and thus was it so exclusively retained in the hands of the clergy. Bishops and abbots were frequently the sole physicians of sovereigns, as was Hugues, Abbot of St. Denis, to the King of France. Milon, Archbishop of Benévent, and Sigoal, Abbot of Epernay; and even some abbesses, like Hildegarde, Abbess of Rupertsberg, were regular practitioners of medicine; but they combined the superstitious rites of the Cabalists with the doctrine of Galen, and a firm belief in magic with the theory of the alchemists, to the scandal of the Church and the corruption of medicine.* To such an extent did this proceed, that Pope Innocent II., fearing the alienation of the ecclesiastics generally from their own special vocation to the more lucrative practice of physic, convened a council, in 1139, by which the exercise of medicine was forbidden, and the more diligent pursuit of theology enjoined. Roger also introduced most stringent measures for the protection of his Neapolitan subjects; and his grandson, Frederick II., resorted to still more rigorous means, of which I have already spoken.

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* In Scotland, even at the present day, it is very commonly believed that the seventh male child in a family has the gift of curing the king's evil by touch. See Brand's Observations on the Popular Antiquities of Great Britain, vol. iii. p. 303, note.

† Hallam's Literary History, vol. i. p. 119.

The decrees, however, both of pope and emperors, were ineffective; and about thirty years after the first another council, convened by Alexander III. at Tours, forbad ecclesiastics attending lectures on medicine, and ordained excommunication as a punishment for a disregard of the enactment. It also denounced those dignitaries of the Church who might sanction resistance, and deprived them of their titles and revenues.* But even these stringent measures failed, and eventually a kind of compromise was effected, whereby the clergy were allowed to prescribe and administer medicine, whilst they consented to relinquish surgery, which by this means fell into the hands of smiths and barbers, who had previously exercised their skill in the minor operations of bleeding and the dressing of wounds.

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* Dr. Henry, in his "History of Great Britain" (p. 114), states that many bishops and dignitaries of the Church acted as physicians in ordinary to kings and princes, by which they acquired both riches and honour. Richard Fitz-Nigel, Bishop of London, was apothecary to Henry II. See also Histoire Littéraire de la France, tom. ix. pp. 193, 194.

Every cathedral had a college attached to it†, and when ecclesiastics were enjoined to discontinue the practice of medicine, the pope did not satisfy himself by a mere prohibition, but introduced a means to make it effectual. He promoted the episcopal schools of Padua, Ferrara, Pavia, and Milan into universities‡, and constituted medicine a separate branch of study;

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* The clergy were almost the only persons in this period who taught and practised physic, as well as the other sciences; and we meet with very few celebrated for their medical skill who were not priests or monks. This profession became so lucrative, and so many monks applied to the study and practice of it, deserting their monasteries and neglecting their own profession, that a canon was made in the Council of Tours, A.D. 1163, prohibiting monks to stay out of their monasteries above two months at one time teaching or practising physic. Henry's History of Great Britain, vol. vi. p. 114; see also Bulæi, Hist. Univers. Parisien. tom. ii. p. 575.

† V. A. Huber on the English Universities; translated from the German by Francis W. Newman, vol. i. p. 3.

‡ Huber. Also Meiners' Geschichte der Entstehung und Entwickelung der hohen Schulen unsers Erdtheils. 2ter Band. p. 206.

but he was as unwilling to relinquish the jurisdiction over medicine as were his subordinates the practice of it, and the interdiction was consequently futile; for, notwithstanding the division proposed, medicine was almost exclusively studied by the sacerdotal orders. To this circumstance was due the establishment of many universities in Italy; for example, Frederick II. originated those of Bologna, Naples, and Messina; while in Cisalpine Europe those of Paris, Toulouse, Valencia, and Vienna, were first organised in the thirteenth century.*

The University of Montpellier was formed shortly after that of Salerno, and in the twelfth century had acquired great celebrity, chiefly in consequence of its botanical garden, the first of the kind wherein every medicinal plant was cultivated. All universities accepted as a model the plan of Salerno, but at Montpellier the superior merits of the old and original Greek authors came to be properly appreciated.

The monastic colleges were assuredly intended for the cultivation of the highest branches of learning, and Huber supposes that an essential similarity appears between the general movement of mind in the twelfth and the nineteenth centuries. "Both," says he, "are characterised by philosophic speculations—a striving in both without tangible results—and in both a plentiful supply of materials."* But the comparison does not, to my mind, appear a just one; for even if in Germany the spirit of transcendentalism (which has characterised the study of moral philosophy) has led to no tangible result, the researches in physical science have; whereas, as M. Huber himself states, in the twelfth century they lost their positive nature, and were swallowed up in the vortex of phantasy.

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* It may be inferred from Huber, that the University of Paris was founded before the thirteenth century, as stated by Sprengel; for in speaking of Oxford, he says that, as early as the ninth century, Oxford was the seat of a school of the highest intellectual cultivation then existing, and that by the end of the eleventh it had as good a title to be called a university as that of Paris. Nothing of the sort can be shown of Cambridge till after the twelfth century had begun, but in the thirteenth she takes her place by the side of her elder sister.

The thirteenth century was remarkable for the impetus which was given to literature and the arts: Dante, in poetry, Cimabue and Giotto in painting, opened, as it were, a new era; and in medicine, as in every other branch of human research, since the dark ages, Italy has sent forth her own children to lead the way; for the invention of paper, by increasing manuscripts, was the means of diffusing the knowledge which had been accumulating at Salerno, to all other universities. But although Italy has thus been the pioneer, she has been destined to be eclipsed by other countries.

In medicine, Paris quickly acquired the ascendancy; and so popular was that university, that the students were said to be more numerous than the inhabitants. This was due to the teaching of Pierre the Lombard (Petrus Lombardus), who originated the scholastic system, and adopted the "Organon" of Aristotle as his text-book.

This scholastic philosophy, extravagant as were many of its premisses, and some of its purposes, had, nevertheless, an important part in the course of human events to accomplish. It was, in fact, an effectual means of training the instructors of men in the athletic use of their intellectual faculties; but for which the emancipation of the mind from the errors and tyranny of Papal Rome would, in all probability, have never occurred. But the men who founded the faculty of medicine of Paris, experienced some little difficulty in obtaining admission to the honours of the university, in consequence of the ignorance and prejudice which prevailed amongst them. This was in the reign of Louis VII., when ecclesiastics still applied themselves to medicine; and, as physicians were interdicted marriage, they lived like monks, and most of them were, indeed, canons of Paris.* On being admitted into the faculty, they made a virtue of necessity, and abjured surgery as an indecent art.

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* Huber, vol. i. p. 6.

It is stated by Girodat, in his "Recherches Critiques et Historiques sur l'Origine et sur le Progrès de la Chirurgie," on the authority of Pasquier, that the practitioners of medicine and surgery before this time were called *mires* †; but, on acquiring the doctor's degree, they assumed the name of physician, *i. e.* investigators of nature.

Some few intelligent men, unwilling to relinquish the resources which they possessed as surgeons, though qualified to be admitted into the faculty, preferred the treatment of external diseases to the more uncertain practice of physicians, combined medicine with surgery, thinking it no degradation to use their hands, as well as their heads; and, in accordance with their profession, they were denominated Médecin-Chirurgiens. In their section, we find the names of Botal, Le Febvre, Rousset, Le Geay, D'Amboise, Petit, and Jean Pitard, who, as surgeon-in-chief to St. Louis, induced that monarch, in 1238, to found a college of surgery. Sprengel accords this honour to Lanfranc, who was a professor of surgery in Paris at a subsequent period, but he was born at Milan in 1295; whereas the following ordinance by St. Louis to the Provost Etienne Boileau, bears the date of 1258.* "Li Prévot de Paris par le conseil de bonnes gens et des plus loyaux Cyrurgiens de Paris, liquel ont juré sur Saints devant le Prévot que eux bien et loyaument enchercheront ceux qu'ils croient et arideront qu'il ne soient dignes d'ouver, et n'en déporteront ne greveront ne por amour ne por haine, et ceux qui n'en seront dignes nous en baudront les noms."

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* Girodat, Recherches Critiques et Historiques sur l'Origine de la Chirurgie, p. 16.

† Idem. p. 54.

Very soon after the Council of Tours, the barbers became an important body, by extending the boundary of their calling, and were made to submit to an examination at the College of Surgery, by an ordinance of Philippe le Bel in 1301.†

The next evidence we possess of British learning, is referable to the beginning of the ninth century, when the priesthood were particularly conversant with that part of the Jewish law, which conferred on their body a tenth part of the produce of the land. According to Hume, the reverence for the clergy was then such, "that wherever a person appeared in a sacerdotal habit, the people flocked around him; and, showing him all marks of profound respect, received every word he uttered as the most sacred oracle." Unfortunately the priests were wholly Saxons, and almost as ignorant and barbarous as the laity; so much so, that Alfred on his accession knew but one person south of the Thames who could so much as interpret the Latin service, though many were daily repeating it. He therefore invited over the most celebrated scholars from all parts of Europe, and established monastic colleges, as well as the University of Oxford.* But the most effectual expedient employed by him for the encouragement of learning was that of his own personal example, for, though unable to distinguish one letter from another, at the age of twelve †, he acquired more knowledge, and composed more books than any of his subjects. He appointed twenty-six professors to each college at Oxford, and erected Halls for their habitations. He moreover endowed these institutions, and their fame as seats of learning spread far and wide throughout Europe, insomuch that strangers from all nations came to study and reside in them.

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* Girodat, Recherches Critiques et Historiques sur l'Origine de Chirurgie, p. 47.

† Idem. p. 92.

The celebrity which Oxford thus acquired was retained till the Norman dynasty was established, in 1066, when the revenues of the colleges were seized and teaching suspended. Other institutions took advantage of this, and assumed the discipline which had belonged to Oxford. From these more humble establishments the philosophy of Greece extended itself, but with no very great degree of energy; indeed learning rather declined; and at the time when Petrus Lombardus originated the scholastic system, the university of Paris eclipsed all others. Adelard, a Benedictine monk of Bath, who had visited Italy and dwelt some time among the Arabs, translated several Greek works on medicine, and thus advanced the knowledge of the art in this country; whilst many Dominican monks were zealous in disseminating the knowledge of Aristotle in western Europe, when the erudition of that philosopher was again recognised, and his works enjoyed a renewal of the popularity which had been accorded almost exclusively to Hippocrates and Galen. By such means, a few intelligent men were enabled to study medicine as a science, and the following descriptions of the theoretical and practical physicians of the twelfth and thirteenth centuries, as recorded by one of the most learned and ingenious men who flourished at that period, are exceedingly interesting.

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* Cooper, in his "Annals of Cambridge," refers the origin of that university to the year 1110, when Joffrid, Abbot of Croyland, sent Sir Gislebert, his fellow-monk, to Cotenham, whence he went daily to Cambridge, and in a hired barn openly taught divinity, philosophical theories, and other primitive sciences. Vol. i. p. 23.

† Strutt, vol. ii. p. 243.

"The professors of the theory of medicine are very communicative; they will tell you all they know, and perhaps, out of their great kindness, a little more. From them you may learn the natures of all things, the causes of sickness and of health, how to banish the one and preserve the other; so they can do both at pleasure. They will describe to you minutely the origin, the beginning, the progress, and the cure of all diseases. In a word, when I hear them harangue, I am charmed; I think them not inferior to Mercury or Æsculapius, and almost persuade myself that they can raise the dead. There is only one thing that makes me hesitate. Their theories are as directly opposite to one another as light and darkness. When I reflect on this I am a little staggered. Two contradictory propositions cannot both be true.* But what shall I say of the practical physicians? They soon return from college full of flimsy theories to practise what they have learned. Galen and Hippocrates are continually in their mouths. They speak aphorisms on every subject, and make their hearers stare at their long, unknown, and high-sounding words. The good people believe that they can do anything, because they pretend to all things. They have only two maxims, which they never violate, — Never mind the poor; Never refuse money from the rich."*

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* Dr. Henry's History of Great Britain, from J. Sarisburiens. Policrat. b. ii. c. xxix. p. 147.

The tone of quiet sarcasm in which the above sentences were written impress the whole with such an air of truthfulness, and mark the state of knowledge with such precision as can only be appreciated when our unlucky fate, or the course of events, brings us in contact with inflated smatterers at the present day.

The traditions of magic, however, were strongly antagonistic to a rational treatment of disease, and had obtained so profound an influence on the Saxon mind that more miraculous cures were wrought by the relics of Thomas à Becket, and more impudently attested, than the most swaggering quack of the present day has the assurance to boast of.†

Another form of magic was not unfrequently depended on, nor was it less efficacious than the appliances of the practitioners recorded in the Chronicles of Strutt. Armed with far more potent balm in their own persons than their aged parents or priestly rivals, youthful ladies were wont to attend at the bedsides, and minister with gentle assiduity to the infirmities of their chivalrous knights*, who were ever ready to engage in tournaments, when they hacked and hewed each other, from mere *gaieté de cœur*, to do honour to their fair damsels. This, however, is a phase of medical history which has been appropriated by the novelist as an interesting subject of literature; hence, with all due respect for the romance of life, I must pass on to the sterner realities, premising, however, to those who are curious in the matter, that much information may be obtained from Pasquier, a romance historian, who affirms that it was by no means uncommon for knights who had fought for their ladies to commit the care of their wounds to the objects of their affections, who in many instances possessed ointments of great repute†, as well as charms of a healing quality.

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* J. Sarisburiens. Metalog. b. i. c. iv.; see also Dr. Henry's History of Great Britain, vol. vi. p. 115.

† Sprengel.

Several instances are recorded of English ecclesiastical physicians, who flourished during the thirteenth century. One of the earliest was John Giles, or Joannes Ægidus, a native of St. Alban's. He was educated in Paris, where he was afterwards elected Professor of Medicine, an appointment which he next held in the University of Montpellier. Subsequently he took the degree of Doctor of Divinity, and joined the Dominican monks, amongst whom he became a celebrated preacher. It is said that he was the first Englishman who entered that order. When Robert Grosthead, the famous Bishop of Lincoln, lay on his death-bed, he sent for Master John Giles, learned in physic and divinity, that he might receive comfort both for body and soul.‡

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* Girodat, p. 6.

† Pasquier (Étienne), Recherches de la France, &c. Amst. 1723.

‡ Aikin (Jno.), Biographical Memoirs of Medicine in Great Britain, to the time of Harvey. Ægidus died A.D. 1253.

Hugh of Evesham, or Hugo Atratus, was another English celebrity. He was born at Evesham, in Worcestershire, and studied at Oxford, after which he travelled in France and Italy in pursuit of medical knowledge. His fame as a physician extended throughout Europe, but his renown was great for astronomy and divinity. He united the clerical profession with that of medicine, and obtained notoriety as a pluralist, being a prebendary in the cathedral of York, Archdeacon of Worcester, and Rector of Spofford. Eventually he was created a Cardinal of St. Laurence in Lucina, and died of plague in 1267.*

Roger Bacon also, one of the greatest of English philosophers, after being educated at Oxford, graduated at Paris about 1240, in its palmiest days, and although he gave to medicine a certain impulse, by insisting on the study of the exact sciences as a means of acquiring accurate notions in all other branches of human knowledge, yet was his mind so imbued with scholastic subtleties, and his belief so strong in the possibility of an universal medicine, of which the basis was astrology, that the impulse was not a healthy one.† Instead of recommending the record of simple observation, as Hippocrates and Aristotle had done before him, he advocated a strict examination of the opinions of his predecessors, and so the contradictory tenets of Aristotle and Averrhoës, of Galen and Avicenna (each of whom was judged to be infallible) came to be, if not the chief, at least a great part of medical education. A system of reasoning on abstract questions, without reference to facts, was sanctioned by his teaching, and thus many things were decided to be bad for certain diseases (in spite of observation to the contrary), because those things were *substances*, whereas diseases were *accidents*, and therefore of unlike nature!

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* Aikin, Biographical Memoirs, &c. pp. 7, 8. Atratus wrote a treatise, denominated "Canones Medicinales."

† Meiners, Vergleichung der Sitten, vol. ii. p. 710.

It was also the prevailing belief that an intimate relation existed between the human body and the planets, and that medicine should be administered in relation to the planetary influence. Thus astrology was the oracle consulted before a dose of medicine was prescribed, and the chief mode of prognosticating the issue of disease was based upon it.

His veneration of ancient literature drew on him the implacable hatred of his contemporaries, but more especially of the clergy, whose general ignorance at that time was described as being so great that they knew no property of the circle except that of keeping out the devil, and considered philosophy as allied to, if not identical with, heresy itself.

Roger Bacon was a Franciscan monk, an order which had but recently been established in England with the avowed object of counteracting the sloth and evil habits of the beneficed clergy and monks of the older denominations; but his thirst for knowledge displayed itself so strongly that his superiors were alarmed at it, and he came to be branded as a magician, and was confined to his cell without writing materials. This cruelty was not, however, of long duration: for the fame and suffering of the poor monk came to the ears of the pope, who did himself everlasting honour by stepping in to save Bacon from his enemies. In a papal brief, during the second year of his pontificate, Clement IV. ordered him to put on record his discoveries, and forward them to Rome without delay.

The alacrity with which he set to work, and the immense amount of labour which he performed in little more than a year and a half, are evidence of the intense delight he experienced at the deliverance from the restraints of his ignorant superiors, by one whom he and they alike acknowledged as the highest authority on earth.

To Roger Bacon is ascribed, by some persons, the invention of the microscope, an instrument which, in its present condition, enables the physiologist to unravel all organised tissues, and suggests a kind of proof to those theoretic deductions which have, of late; made such vast incursions into the invisible atomic world, which lies even beyond the scrutiny of the microscope. It is the general belief, however, that Salvino degli Amati first conceived the idea of forming lenses of glass. Although Roger Bacon described a lens, and explained why a convex glass magnifies; he spoke of it as already in use, as an instrument to assist the sight of old persons, and those who have weak eyes. Another Englishman, named Gilbert, or, as he was called, Gilbertus Anglicanus, is the first English *surgeon* of whom we have any authentic record. He was a stanch follower of Petrus Lombardus, and wasted much of his time in discussing vain and subtle questions, after the scholastic dogma of universals, which, from that time to this, has never ceased to poison philosophy. Its culminating point has been quoted by Mill, in the noted aphorism of Condillac, that science is nothing but "une langue bien faite;" or, in other words, that the one sufficient rule for discovering the nature and properties of objects, is to name them properly; and a choice example of this is the question which Gilbert propounded to himself on the destructibility of the vegetable or sensible soul, and the indestructibility of the rational soul; concluding that "the vegetable soul, owing its property to matter only, of which consequently it is but a form, must necessarily perish; whereas the rational soul, not being a simple form, nor susceptible of action or passion, cannot be subject to destruction."

Modern philosophers have not been sparing in their contempt for this method of reasoning *; but in an age when, according to Macaulay, not one man in five hundred could spell his way through a Psalm, when books were few and costly, and the art of printing unknown; when, moreover, the only competitors in medicine were ignorant monks, who practised all sorts of magic and incantations, whilst they professed to be guided by the principles of Galen, common justice bids us touch with a tender hand the errors of those whose earnest zeal urged them on to obtain the information which had been acquired and recorded in manuscripts before their time. Information which often involved long and expensive journeys to procure, without the prospect of immediate reward, or even the encouragement which the approbation of their contemporaries might give, But Gilbert did not confine himself to speculative reasoning; for he described Lepra very accurately, and laid down a rational system of treatment for many diseases which had been imported into England by the Crusaders.

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* Sir J. Herschell, in his "Preliminary Discourse on the Study of Natural Philosophy," remarks: "If the logic of that gloomy period could be justly described as 'the art of talking unintelligibly on matters of which we are ignorant,' its physics might, with equal truth, be summed up in a deliberate preference of ignorance to knowledge, in matters of everyday's experience and use."—P. 111.

Peter d'Abano did in Italy what Roger Bacon and Gilbert were doing in England. Like them, he was fond of subtle speculations; but he was a resolute admirer of Averrhoës, and even repudiated his religion to follow his idol with freedom. He founded his practice on astrology, turning himself to Jupiter at the time when that planet was crossing the meridian, to pray for a happy issue in all his undertakings. His reputed skill in this kind of learning caused him to be regarded in his own day as a magician; and a process was actually commenced against him as such by the Inquisition.

The imputation of being a practiser of magic long clung to the memory of Abano in the popular belief. Among the many questions which he propounded was one which has more or less interested physicians up to the present day, namely, the policy of depletion at the beginning of every acute disease.

Sprengel refers to Johannes Actuarius and Demetrius Propogomenus as two celebrities of the thirteenth century; but they did nothing to advance medical knowledge. The latter, it is true, wrote a sensible treatise on Gout, which he attributed to a constitutional cause, originating in intemperate living,

Thadæus Florentinus was more justly distinguished by the commentaries which he wrote on the works of Hippocrates and Galen. Bernhardus Gordonus also, a Scotchman, and professor of medicine at Montpellier, is spoken of by Freher as a man of some repute; but it was chiefly for mixing up astrology with medicine.*

It would be an act of injustice to Roger of Parma were we to close our notice of the thirteenth century without rendering to him the tribute which is his due, for having first recommended burnt sponge in scrofulous affections; a remedy the use of which was continued until iodine was discovered in its uncombined form.

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* Freheri Theatrum Virorum, arts. "Thadæus Florentinus" and "Bernhardus Gordon."

The introduction of diseases into England by the Crusaders has been incidentally mentioned above, and the question naturally suggests itself as to whether any progress was made in medicine by their expeditions. To this question Heeren has given a very rational answer, by showing that had the sturdy warriors of the West been susceptible of any noble culture during the first half of the thirteenth century, when they were in possession of Constantinople, they might, by means of the splendid library which the patriarch Photius had accumulated in that city, have averted the fate of the two succeeding centuries, for science was still honoured there, and every man who aspired to high dignity in the state was well versed in the Greek classics. But it was not for information that they embarked for the East, and if they did gain any it was in spite of themselves. In medicine it was much the same; for although the Crusaders opened many opportunities, neither in practice nor theory were any improvements made.

For a long time the pilgrimages to the Holy Land had necessitated the establishment of houses for the reception and succour of sick pilgrims. St. Jerome built an hospital at Bethlehem, and his friend Paula caused several to be erected on the road to that village, in order that the devout idlers, as she said, might fare better than the mother of God. But with the crusades many more were established, which were superintended by monks whose only medical knowledge was derived from seeing sickness and from traditional remedies, which they applied with good intentions, but often, it is to be feared, with bad results; for they did not go to the Arab schools of medicine for information.

It often happened with these philanthropic men, as with their more valiant brethren, the Knights-Hospitallers, in arms, that, by some means or other, nursing, as well as fighting, turned out profitable, and that many who began by renouncing ended by acquiring; and with acquisition very worldly motives developed themselves. "The Knights-Hospitallers took lands, raised rents, and imposed taxes and tolls, always saying, and sometimes perhaps believing, that this was what their vow of poverty and abnegation required. Poverty was exchanged for wealth, weakness for power, humility for arrogance, and lo! the poor brethren of the Temple and the Hospital not only succeeded in making themselves autonomous in their half-barrack, half-convent of Syria, but claimed to be so as well in all the European lands into which by purchase, or any other form of conquest, they could contrive to extend their power." . . . . . The arrangements of the order were adapted in every land to the exigencies and accidents of their position. In Syria they encamped; in Rhodes they fortified; in France and England they farmed and amassed money for the general purposes of the ruling body. The hospital, too, was arranged according to the land in which it set its foot. Wherever it came it took pains to introduce as much as it could of its own peculiar organisation. It depended upon a vast variety of circumstances for wealth, and with wealth power was the universal condition of its existence.* Notwithstanding their large incomes, the property of the hospitallers was ruinously encumbered, and how they were relieved does not appear; but as regards the houses for the reception of the sick, it was not uncommon for opulent persons, when dying, to bequeath their property, for the benefit of their souls, to these establishments, in which their bodies had found repose and comfort.

Many diseases and contagious epidemics, which from time immemorial had been common in the East, were brought to Western Europe during the thirteenth and fourteenth centuries, such as the Plague, Lepra, and other affections arising from dirt and libertinage, as well as from the use of common baths.

Of these diseases, Lepra committed greater ravages than any other; and the oldest hospitals, which, as we are told, were not properly established for sick travellers, but for those who were sound†, probably gave the idea to St. Jerome and his friend Paula, of providing for the wants of sick pilgrims, and eventually for the relief of lepers, as well as for their separation from the rest of the community.‡

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* "The Knights-Hospitallers in England;" edited by the Rev. Lambert B. Larking, with an Historical Introduction by John Mitchell Kemble, M.A.: printed for the Camden Society. In this volume we are fortunate in having an account of undeniable authority, which enables us to follow, step by step, many of the more interesting and valuable details of the condition of English civilisation, and to know how Englishmen of different grades lived about the beginning of the fourteenth century.

† Beckmann, vol. iv.; art. "Hospitals."

‡ The subject of leper hospitals is one of considerable interest; but with us it is a question rather of tradition than of existing facts. Of their internal economy, when first established, no information is to be found, nor is it known whether physicians and surgeons

Beckmann speaks of an hospital which some Nestorian priests established in Dschandisabar (a town in Persia), as early as the seventh century.* This institution, it is said, was used as a school for young physicians, who before entering it were obliged to submit to an examination, which consisted in reading the Psalms of David, and portions of the New Testament.

Next to that, the earliest account of any hospital for the reception of the sick which occurs in history, is the description of an establishment founded at Constantinople by the Emperor Alexius Comnenus, during the eleventh century. The narration is made by his daughter, Anna Comnena, in her biography of that Prince.†

Again, in the twelfth century, when the Jew, Benjamin of Tudela, was in Bagdad, he saw many hospitals and laboratories belonging to them, for the distribution of medicines at the public expense.‡ We have already referred to these as originating with the Caliph Almansor.

Some of the distempers to which we have above alluded, were of so formidable a character that men with far greater resources than the barber-surgeons possessed, might well resign themselves as well as their patients to their threatening fate in utter despair.

One particular affection may be mentioned, as it is

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belonged to them. They were superintended by the clergy, and it is probable that a complete History of Leprosy, on which Professor Virchow, of Berlin, is said to be engaged, may bring to light many instances of terrible suffering, and many examples of mistaken oppression.

* Beckmann, vol. iv.; art. "Infirmaries and Hospitals."

† Ibid.

‡ Ibid.

spoken of in the chronicles of the campaign of the Christian army against the Turks under "Saint Louis," about the year 1260.

It is perhaps the earliest *unequivocal* description of the Scurvy with which we are acquainted, although it is very generally believed that Hippocrates, Galen, and the Arabian physicians were acquainted with it, but did not accurately describe it.*

The outbreak in question appears to have originated in the French king's camp, shortly after two great battles with the Turks, when the bodies of the killed had been thrown into a river which flowed between the two opposing armies.

About ten days after, the bodies rose to the surface of the water—a fact which was attributed to the bursting of the gall-bladder; and so numerous were they, that the surface of the water was completely covered by them.

The stench became so great, that the chronicler exclaimed, "Dieux sache quelle puanteur!" added to which, it was during Lent, when the only fish eaten by the soldiers was the *burbote* (sturgeon?) a gluttonous fish, which devoured the putrifying bodies of the slain.

It was under these circumstances that the disease first appeared, with sudden prostration of strength and dark discolouration of the legs, (a ressemblance d'une vielle houze [botte] qui a esté long-temps mucée [cachée] derriere les coffres,) bleeding from the nose, a livid and spongy condition of the gums, from which the barbers were obliged to cut away large pieces to enable their patients to eat, and most offensive odour of the breath.

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* Cyclopædia of Practical Medicine, vol. iii. p. 680.

The historian of the crusade was not only an eye-witness of the disease, but was also affected with it himself; hence, probably, the graphic nature of his narrative, which continues thus: "En la fin gueres n'en eschappoient de celle maladie, que tous ne mourussent. Et le signe de mort que on y congnoissoit continuellement, estoit quant on se prenoit à seigner du neys: et tantoust on estoit bien asseuré d'estre mort de brief. Et pour mieulx nous guerir, à bien quinze jours de la, les Turcs, qui bien savoient noustre maladie, nous affamèrent."*

We do not, from the above, pretend to set forth a theory of the eastern origin of Scorbutus; but, on the contrary, it is intended to show, on historical evidence, that this, like every other form of disease, may be engendered in any locality where the concurrence of predisposing circumstances happen to exist.

It is impossible to imagine the sudden increase of intercommunication between different nations, which the crusades introduced, without some corresponding increase of general information. The effect of such a cause in this our day, when railroads are being projected into every country, is too apparent to be ignored by any one; and although, as has been affirmed, neither the practice nor theory of medicine were immediately improved, yet must the opportunities which were presented to educated physicians of observing diseases, previously unknown to them, have tended more or less to the advancement of their art. The very necessity of attending to the symptoms of such formidable diseases, would naturally divert their minds from a philosophy which mystified all that was clear, and raised futile questions on all that was plain, towards matters of more immediate and vastly greater importance. Thus may we conceive a gradual, but no less real, progress in the fourteenth century, when Europe still teemed with physico-spiritual advisers, by whom all sorts of ridiculous inferences were drawn from hypothetical data. But the dawn of a brighter era was at hand, and reason began to assert its supremacy over the oppression and tyranny of priestcraft in its worst form. By slow, but very slow degrees, medicine was made a distinct calling, although the ecclesiastics retained a most tenacious hold on it, seeing that it enhanced their wealth and power. But, as Sprengel has it, "their insatiate avidity and flagrant incompetency at length led to the adoption of a decision in the university of Vienna, that the hospitals should thenceforth be conducted by the laity, for the better care of the sick poor."

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* Mémoires du Sire de Joinville, ou Histoire de Saint Louis, écrite par Jean Sire de Joinville, Sénéchal de Champagne. Petitot, tom. ii. p. 270.

The wisdom of the above resolution will be duly appreciated when considered in relation to an example which may be regarded as illustrative of the custom of the time. One Petrus Aponensis, who is described by Freher as "theologus, medicus, astrologus, et philosophus," and so mercenary that he would never visit a patient out of town without a stipulation that he should be paid fifty crowns, bargained, when summoned to Pope Honorius IV., that he should be paid 400 crowns a day, so long as he should be in attendance.

The beginning of the fourteenth century gave no great signs of animation, although the art of medicine was diligently cultivated by the Saracens in the east as well as in Spain; and by the Italians, French, and

English in their respective countries. It also found its way into Germany from Greece, by way of the Danube; Vienna and Ratisbon, from their positions, feeling the earliest influence.

The philosophical theory of Galen, concerning the actions of medicines, prevailed throughout Europe, notwithstanding an occasional phantasy which was set forth as an improvement. Anatomy was advanced by the treatise of Rimondino, or Mondino, as he was called for the sake of brevity. He was a professor at Bologna, and restored anatomy in that university.* The treatise in question is entitled, "Anatome omnium humani corporis interiorum membrorum," and had this advantage over the works of Galen, that it was founded on the actual anatomy of the human body. Galen dissected apes, but had very little, if any, practice in human dissection. Torrigiano is noted as a medical writer in the fourteenth century, for having attempted a refutation of Galen; but he did it very unsuccessfully. Mondino was more fortunate than other anatomists during the prevalence of a superstitious prejudice, and his work has been esteemed as classical literature in Italy, where it was long used as a text-book. It has passed through many editions in Bologna, Pavia, Leipsig, Venice, Strasburg, Lyons, and Marbourg, and has the adventitious consideration of being the first anatomical work in which wood engravings were used as illustrations. From this period, every university adopted the habit of opening one or two human subjects every year; a barber being generally charged with the dissection, whilst a professor demonstrated the several organs from the work of Mondino. But so deeply impressed were all anatomists with reverence for what Galen had said, that all recognised three kinds of vessels in the body, the veins carrying blood, the arteries carrying spirituous blood, and the nerves carrying animal spirits; whilst all saw—what the theory of Galen required, but what do not exist—the holes in the septum of the heart, for the due admixture of the venous and arterial blood.* These, and many other fallacies, were implicitly admitted as truths by John of Gaddesden, an English physician, and a professor of medicine, too, in Merton College, Oxford, and, it is said, the first physician who was employed as such at Court.† He was the author of "Rosa Anglica," but superstition and quackery were the most conspicuous features of his practice.

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* Hallam's Literary History, vol. i. p. 119.

The most celebrated man of the age, however, and one of whom the French are still justly proud, was Guy-de-Chauliac. Having studied at Montpellier and Bologna, he practised as a physician and surgeon at Lyons, and subsequently at Avignon, at which latter place he was physician to three successive popes. He wrote a work on surgery, called the "Inventarium, sive Collectorium partis Chirurgicalis Medicinæ," which obtained as great a degree of celebrity in France, as did that of Mondino in Italy. It was a clear exposition of much confused matter, which had been written by his predecessors in the dark ages, and caused Fallopius to speak of Chauliac as the first legislator in surgery, as was Hippocrates in medicine.

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* "Nam iste ventriculus non est una concavitas, sed plures concavitates parvæ — ut sanguis qui vadit ad ventriculum sinistrum à dextro, cum debeat fieri spiritus, continuo subtilletur."—*Anatomia Mundini*, Dryander's edit. 1540, p. 38. By *ventriculus* the septum or partition between the two ventricles is implied.

† Aikin's Biographical Memoirs, &c. p. 10.

Haller paid a just tribute to his merit, in saying that, "having read all works written, up to his time, on that important branch of medicine, he carefully exposed the divers opinions of authors, and duly appreciated each: so that his work may be regarded as an excellent historical sketch of surgery up to his time."

But what augmented the merit of Chauliac, and the confidence which his precepts inspired was, that he practised almost all the operations which he described. He, moreover, nobly vindicated the honour of medicine, by bidding defiance to danger during two visitations of plague at Avignon; boldly and constantly assisting the afflicted, and disdaining the excuse of his colleagues, who held the Arabian notion that medical aid was unavailing, and that the contagion justified flight. His theory of the cause of the disease was the astral influence of the three great planets, Saturn, Jupiter, and Mars, entering into conjunction in the sign Aquarius, on the 24th March, 1345.

Notwithstanding the decision adopted at the University of Vienna, and the exceptional instances of a few distinguished men, the crafty monks managed to keep physicians in subjection by inducing the pope to prohibit these latter from visiting a patient a second time without summoning to their aid a priest for the cure of the soul. Another artifice to which they resorted, was the noising abroad of miraculous cures, which were of such frequent occurrence that it became necessary to define the precise conditions by which cures should be judged of as miraculous; and the following terms were established: First, that the disease should be considered incurable by human agency alone; secondly, that restoration to health should be immediate; and, thirdly, that if any remedial substance were employed no theory should be able to explain its action. In despite of all this, medical saints abounded, and the cures which were reported as having been effected by them were quite as marvellous as those recorded in the "Miracles de Saint Bénoit," lately published by the Société de l'Histoire de France.

Two notable alchemists, whose names have been already mentioned, were the representatives of chemistry as it existed in the fourteenth century. Raymond Lully, to whom the merit of discovering nitric acid has been awarded, was said to have converted a mass of copper into gold, from which the first gold pieces were formed for Edward III. It is very probable that he had acquired the knowledge of refining gold, which was then much practised by Germans at Venice; and as the persons who were thus engaged were closely watched, so that the secret of their manipulation might not be divulged, a degree of mystery was attached to the process, and gold-workers were thus regarded as gold-makers.

So conspicuous was Raymond Lully as an adept, that he suffered martydom in the cause of his art. In 1315 he was stoned to death in Africa.*

Arnoldus de Villanova was also reported to have converted a mass of copper into gold, and was driven out of Paris because it was supposed that he had dealings with a power to whom many other supernatural gifts are attributed. Arnoldus wrote a book which he entitled "De Judiciis Astrorum," wherein he showed the prevalence of the belief that astrology was an essential branch of the healing art. His precepts for success in practice were of the highest order, and have been the grand secrets of many an aspirant for medical fame since his day. "Work on your patients," says he; "secure their confidence, light up their imagination, and you are sure of success."

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* Raymond Lully was a native of the island of Majorca. He passed his early youth in profligacy and superstition, but was reclaimed by falling in love with a young lady afflicted with cancer. This circumstance induced him to apply himself to the study of medicine, which he did in Paris, with a view to discover a cure for her complaint, in which he is said to have succeeded. Œuvres de Seigneur Brantome, vol. iii. p. 221.

Freher, in his "Theatrum Virorum," informs us that when expelled from Paris he fled to Italy, where, being accounted great in the art of magic, he was selected from amongst all the Italian physicians to attend the pope, who was then suffering from a severe disease. Freher also enumerates the titles of twelve medical works written by Arnoldus Villanovanus, amongst which are treatises on lepra, gout, stone, poisons, &c.

Towards the middle of the century both surgery and medicine were called on for resources against two of the most fearful scourges which have ever afflicted the human body. I allude to gun-shot wounds and the plague. About the time that Arnoldus was experimenting with the nitrum of the ancients, which was an impure saltpetre, many alchemists were using it as an agent in the attempt to convert the baser metals into gold; and it is said that one Berthordus or Michael Schwartz, a Cordelier monk of Goslar in Germany, by an accidental admixture of sulphur and charcoal with the nitrum discovered gunpowder. Beckmann inclines to the belief that gunpowder was invented in India, where saltpetre is a natural production of the earth, and from thence brought by the Saracens to the Europeans, who discovered the method of employing it in cannon and in small arms. This latter opinion is strengthened by the fact of its composition having been spoken of by Roger Bacon in the thirteenth century. Be this as it may, it was first used in warfare at the battle of Crecy, in 1346, when the great majority of both surgeons and physicians depended on the most absurd and superstitious receipts and formulas for the cure of wounds and diseases. Surgeons therefore were as ill-prepared to meet this new and artificial element of destruction, as were physicians to encounter the plague or black death which broke out in China in the year 1334. Its origin, however, according to Papon, is lost in the obscurity of remote ages; for even before the Christian era we are able to trace many references to pestilences which appear to have partaken of the nature of the eastern or black plague, with inflammation of the lungs.

At the end of the thirteenth century one Gentilis Fulginas is recorded by Petrus Castellanus, in his "Lives of Illustrious Medical Men," who wrote a treatise which he called "Tractatus de Peste." Fulginas died in 1310.

"When," as Hecker has suggested in his work on the "Diseases of the Middle Ages," "the forces of creation come into violent collision, the ordinary alternations of life and death are apt to be disturbed, and the destroying angel waves over man and beast his flaming sword." So it happened about the middle of the fourteenth century, after a series of terrestrial and atmospheric perturbations, which lasted over a period of fifteen or sixteen years, commencing in China and ending in Western Europe, a plague broke out in the former country, and in Tche alone carried off five millions of individuals. Thence it extended to the western parts of Asia, to Africa, and Europe, depopulating every city and town which it successively attacked.

Perhaps no disease ever dissolved the ties of kindred and friendship so much as did this ; nor did the ravages of any other produce such fearful destruction of life. It is not my province to describe the nature of disease, but inasmuch as there is no European language in which its traditions are not preserved, I may be excused for dwelling awhile on this gloomy subject.

In Asia it commonly set in with bleeding at the nose, which was a sure sign of death. But in Europe generally the disease was ushered in with tumours, or boils, as large as eggs, in the armpits and groins particularly, although others were diffused more or less over the body, together with black spots, indicative of the putrid decomposition which was at work in the still living body ; and, on account of these, the disease was called the Black Death.

An inflammation of the lungs quickly supervened, producing expectoration of blood, which sent forth an odour so pestiferous as to impel even mothers to desert the bedsides of their stricken children, and so infectious as to spread the disease far and wide.

Each case of plague lasted from three to four days, but sometimes it killed in as many hours. In England where the first outbreak occurred in August, 1349, the afflicted died generally in two days ; and thus nine-tenths of the inhabitants are said to have been carried off.

Many places were left absolutely desolate. The ordinary burial-places were too small to contain the dead, so that at Avignon Pope Clement VI. consecrated the Rhone, that bodies might be thrown into it without delay ; and in many other cities huge pits were dug to receive the dead by thousands. It is computed that Europe alone lost, during the plague of 1349–1351, as many as 25,000,000 of its inhabitants.

During the prevalence of the disease society was said to be completely demoralised. In many places the service of God was suspended, either, as Guillelm de Nanguis informs us, from the priests having withdrawn themselves through fear, or from those who were courageous and faithful enough to remain at their posts having been swept away, so that churches were bereft of their ministers. The authority of law was disregarded with impunity, from the sittings of most of the legal courts as well as of Parliament being suspended. Public instruction suffered in an equal degree from most of the universities being deserted, as it was observed that the assemblage of large bodies of people was especially dangerous. In short, every social and domestic relationship was disturbed.

The moral results of the pestilence were one and all traced back to the influence of terror upon the mind, showing itself, now in the recklessness which, shrinking from the thought of the future, seizes hold of the present for what physical enjoyments it can afford; now in the absorption of the entire nature in the one hope of self-preservation, and leading, in both cases, to the undoing of all moral ties. Instances of boundless sensual excess on the one hand, and, on the other, of desertion of the nearest kindred in their necessity, through dread of infection, make up the staple of the accounts of the Black Death, as they do of the reports of every other great pestilence. The debasing effects of fear—the most entirely selfish and degraded of human feelings, than which no other brings out so clearly all the worst elements of our nature—

and its power of entirely oversetting the balance of the mind morally and intellectually, are conspicuously displayed on occasions of great and inevitable public peril. They justify the instinctive contempt and aversion with which cowardice has been regarded by all men in all times.

After its cessation a remarkable fecundity was observed in women generally; twins and triplets were by no means uncommon at a birth; and it is a curious fact that this prolificness has been noticed after other destructive pestilences, as well as in new and thinly populated countries. It is just possible, however, that a few instances are multiplied indefinitely; confirmatory examples are remembered, and contradictory cases ignored under the influence of strong excitement, or the love of the marvellous; either of which is apt to prevail in an enormously reduced or small population.

It was affirmed too that lawyers increased in a corresponding ratio to the endless disputes which then prevailed respecting inheritances.

The Black Death was generally regarded as a punishment from God, and when immorality and vice were rampant, a spirit of remorse suddenly seized the minds of Christians of every denomination.

In Hungary a sect of zealots of both sexes, but chiefly of the lower class, arose in 1349, calling themselves Flagellants, or Brothers of the Cross; arrogating to themselves a mediatorial influence, and affecting a vicarious repentance for the people at large for the avowed purpose of averting the plague. According to Sprengel they ran about the streets half naked, flagellating themselves by day as a means of expiation, and passed the nights in frightful debauchery; but Herder informs us, from satisfactory authority, that "the order gained in repute; that many nobles and ecclesiastics ranged themselves under their standard, and that their bands were not unfrequently augmented by honourable women and nuns; so powerfully were minds of the most opposite temperaments enslaved by the infatuations."

Their dress consisted of a black garment, with a red cross on the back, another on the breast, and a third on the cap, which covered the head as far down as the eyes. Tapers and beautiful banners of velvet and gold were borne before them wherever they went in bodies, and each flagellant carried a scourge with three lashes, each one tied in knots, into which were inserted pieces of pointed iron.

They did penance twice a day—morning and evening—going abroad in pairs, singing psalms; and, on arriving at the places of flagellation, they stripped the upper parts of their bodies, put off their shoes, and applied their scourges with such violence, that blood flowed from the wounds.

This idea of propitiating the Deity by self-inflicting torture, did not originate with the Hungarians at this particular juncture; for Herodotus relates that the Egyptians flogged themselves at one of their religious annual celebrations; and though the legends of early Christianity, which describe the lives of Saints, do not speak of self-flagellation, yet they record several instances of the devil venting his rage on those holy men, by giving them a sound flogging. The earliest instances in Europe of self-flagellation are said to have occurred about A. D. 400; but Cardinal Damian, in 1056, promoted the practice by all his influence, as a laudable usage of the faithful.

The Flagellants spread over the whole of Europe in the fourteenth century, and, by the intimate union of their leaders into a secret society, they very soon became a formidable body to the clergy, as well as to the laity. By assembling in numbers, however, they promoted the spread of the disease which they pretended to avert. A band of them reached London in the reign of Edward III. Each day, at an appointed hour, they assembled, ranged themselves in two lines, and paraded the streets chanting, and scourging their naked shoulders. At a given signal, with the exception of the last, they threw themselves flat on the ground, and he who was last, as he passed by his companions, gave each a lash, and then also lay down. The others followed in succession, till each individual in his turn had received a stroke from the whole brotherhood. The citizens of London are said to have gazed, marvelled, pitied, and commended; but went no farther. The English then, as now, were not a demonstrative race; and, when we are told that they allowed the foreign zealots to monopolise all the merit of such a religious, but painful exercise, there is room for something like a feeling of pride in the fact, as an indication of an element, especially sterling and truthful, in the national character. Those impressive solemnities which abound in other countries, are distasteful to the British character; and even those men who regret the want of them, and who may be labouring to revive expressive forms and ceremonies, will jest at them when practised out of their own particular beat.

The poor oppressed Jews were again the subjects of the most malevolent persecutions. According to Dlugoss, the Polish historian, they were everywhere suspected of having caused the disease by poisoning the wells or infecting the air; and, in many places, they were given up to the implacable fury of the people, or sentenced by ignorant and merciless tribunals to the most cruel deaths. At Strasburg, 2000 Jews were burnt, and at Mayence as many as 12,000 were either burnt, or otherwise executed. Driven to despair at Spires, they assembled in their own quarter, and set fire to their habitations, by which they were consumed, with their families. In the Castle of Chillon, one Balavignus, a Jewish physician, was put to the rack, and under torture a confession was extorted from him, that he had received a poison from the Rabbi Jacob, of Toledo, with which he had poisoned a spring near the shore at Thonon, and a well, called La Conerayde, near Mustruez. He also implicated other Jews of Neustadt, and in a letter of the Castellan of Chillon it is stated, that "all the Jews of Neustadt were burnt, according to the just sentence of the law." After the unfortunate confession of Balavignus, others were made in various places, and it was generally believed by the populace that the suspicion was well founded. Many Christians who had communication with Jews were also denounced, arrested, and flayed, on the bare suspicion of being accessory to the plot of poisoning; and, in their dying moments, some were brought to confess to a complicity of which they were altogether innocent.

The physicians of the day were taken at a singular disadvantage, by reason of the superstitions already noticed, on which their practice was founded, but the formidable nature of the disease sharpened the wits of a few, whose knowledge, as Herder says, was by no means despicable. He quotes Gentilis de Fulgines of Perugia, who attributed the plague to a putrid corruption of the blood, and recommended a purification of the air, together with a nutritious diet, as the best protection against it. Galeazzo di Santa Sofia also witnessed, and wrote on the Black Death. He attributed it to an unknown change, or corruption in the air, and supposed that the change in question might be caused by the putrefaction of locusts that had perished in the sea, and were again thrown up, combined with astral and terrestrial influences. His notion of treatment fully justified Herder's idea of him. He proposed, 1, bleeding to evacuate putrid matter from the blood; 2, strengthening the heart to prevent putrefaction; 3, appropriate regimen; 4, improvement of the air; 5, appropriate treatment of tumid glands or boils; and 6, attention to prominent symptoms. But these men were exceptional; for by the great majority the theory of Guy de Chauliac was generally received as the chief cause, and the popular receipts of the age were depended on for treatment.

By reflecting on the various medical writers of the fourteenth century we may arrive at a tolerably correct notion of the state of the profession in those days; but reflection is rendered superfluous when we find a document so authentic and so positive as that which was issued by the medical faculty of Paris, on the occasion of being commissioned to give their opinion relative to the causes and prevention of the plague.

The report is so remarkable that I may be excused for copying it verbatim from Dr. Babington's translation of Herder.*

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* "We, the members of the College of Physicians of Paris, have, after mature consideration and consultation on the present mortality, collected the advice of our old masters in the art, and intend to make known the causes of this pestilence, more clearly than could be done

This choice piece of medical erudition requires no comment to mark its status, either in the course of

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according to the rules and principles of astrology and natural science; we therefore declare as follows:—

"It is known that in India, and the vicinity of the great sea, the constellations which combated the rays of the sun, and the warmth of the heavenly fire, exerted their power especially against that sea, and struggled violently with its waters. (Hence vapours often originate which envelope the sun, and convert his light into darkness.) These vapours alternately rose and fell for twenty-eight days; but, at last, sun and fire acted so powerfully upon the sea, that they attracted a great portion of it to themselves, and the waters of the ocean arose in the form of vapour; thereby the waters were, in some parts, so corrupted, that the fish which they contained died. These corrupted waters, however, the heat of the sun could not consume, neither could other wholesome water, hail, or snow, and dew originate therefrom. On the contrary, this vapour spread itself through the air in many places on the earth, and enveloped them in fog.

"Such was the case all over Arabia, in a part of India, in Crete, in the plains and valleys of Macedonia, in Hungary, Albania, and Sicily. Should the same thing occur in Sardinia, not a man will be left alive; and the like will continue so long as the sun remains in the sign of Leo, on all the islands and adjoining countries to which this corrupted sea-wind extends, or has already extended from India. If the inhabitants of those parts do not employ and adhere to the following or similar means and precepts, we announce to them inevitable death, except the grace of Christ preserve their lives.

"We are of opinion that the constellations, with the aid of nature, strive, by virtue of their divine might, to protect and heal the human race; and to this end, in union with the rays of the sun, acting through the power of fire, endeavour to break through the mist. Accordingly, within the next ten days, and until the 17th of the ensuing month of July, this mist will be converted into a stinking deleterious rain, whereby the air will be much purified. Now, as soon as this rain shall announce itself, by thunder or hail, every one of you shall protect himself from the air; and, as well before as after the rain, kindle a large fire of vine-wood, green laurel, or other green wood; wormwood and chamomile should also be burnt time or knowledge. The subject was peculiarly adapted for the fantastic genius of astrological reasoners, and is an apt illustration of the proverb, which determines that when people flounder in the mud, they get deeper

in great quantity in the market-places, in other densely inhabited localities, and in the houses. Until the earth is again completely dry, and for three days afterwards, no one ought to go abroad in the fields. During this time the diet should be simple, and people should be cautious in avoiding exposure in the cool of the evening, at night, and in the morning. Poultry and water-fowl, young pork, old beef, and fat meat in general, should not be eaten; but, on the contrary, meat of a proper age, of a warm and dry, but, on no account of a heating and exciting nature. Broth should be taken, seasoned with ground pepper, ginger, and cloves, especially by those who are accustomed to live temperately, and are yet choice in their diet. Sleep in the day time is detrimental; it should be taken at night until sunrise, or somewhat longer. At breakfast, one should drink little; supper should be taken an hour before sunset, when more may be drunk than in the morning. Clear light wine, mixed with a fifth or sixth part of water, should be used as a beverage. Dried or fresh fruits, with wine, are not injurious, but highly so without it. Beetroot and other vegetables, whether eaten pickled or fresh, are hurtful; on the contrary, spicy pot-herbs, as sage or rosemary, are wholesome. Cold, moist, watery food is in general prejudicial. Going out at night, and even until three o'clock in the morning, is dangerous, on account of the dew. Only small river fish should be used. Too much exercise is hurtful. The body should be kept warmer than usual, and thus protected from moisture and cold. Rain water must not be employed in cooking, and every one should guard against exposure to wet weather. If it rain, a little fine treacle should be taken after dinner. Fat people should not sit in the sunshine. Good clear wine should be selected and drunk often, but in small quantities, by day. Olive oil, as an article of food, is fatal. Equally injurious are fasting and excessive abstemiousness, anxiety of mind, anger, and immoderate drinking. Young people, in autumn especially, must abstain from all these things, if they do not wish to run a risk of dying of dysentery. Bathing is injurious. Men must preserve chastity as they value their lives. Every man should impress this on his recollection, but especially those who reside on the coast, or upon an island into which the noxious wind has penetrated."

into it at every struggle. Had the members of the faculty simply advised the drainage of their towns, ventilation of their houses, and clean habits, it is possible that the important truth would long since have been recognised, that epidemics, like new varieties of animals, spring up under favourable circumstances, each having its own congenial climate; and that would have been a grand step towards averting a disease which made sixteen successive outbreaks in the fourteenth, and seventeen in the fifteenth centuries in Europe alone.

In consequence of these frequent and formidable visitations, a proposition, more remarkable for its practicability than for its humanity, was made in 1379, by Viscount Bernarbo, "that every plague patient should be taken out of the city into the fields, there to die or recover; and that those taking them and attending on them should remain isolated for ten days before being readmitted into the city."* On each successive outbreak taking place, a modification of Bernarbo's system was adopted, until eventually the necessity of constructing isolated houses, or Lazarettos, for the reception of the sick or suspected, was generally admitted, as a means of protection for whole towns; and so numerous were these establishments that Heeren informs us as many as 2000 existed in France alone in the middle of the fifteenth century. The term of forty days was fixed on as a probationary sojourn in the lazaretto, probably from the doctrine of critical days, which determined the fortieth as the last of all ardent diseases; hence the term quarantine.

Before many of the early victims of plague were cold in their festering pits, another epidemic broke out in the fourteenth century, the bare contemplation of which encourages the hope that we are a wiser if not a better race than our forefathers at that period. The imagination had a greater share in the perpetuation of the epidemic in question than had any miasm or noxious exhalation. It continued more or less extensively for upwards of two centuries; since which isolated cases only have been reported.*

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* Hecker's Epidemics of the Middle Ages, p. 62.

This, probably, was the epidemic madness of which Webster speaks, as occurring in England towards the end of the fourteenth century.†

Burton, in his "Anatomy of Melancholy," notices it as the "Chorus Sancti Viti, or Saint Vitus's Dance; the Lascivious Dance, Paracelsus calls it, because they that are taken with it can do nothing but dance till they be dead or cured. It is so called for that the parties so troubled were wont to go to St. Vitus for help; and after they had danced there awhile they were certainly freed."

In 1387 a party of Germans of both sexes, but chiefly of the lower classes, made their appearance in the streets of Aix-la-Chapelle, dancing in circles hand-in-hand for hours together, in a state of uncontrollable frenzy, until they became perfectly exhausted and fell to the ground. Such was the force of example, that the mania quickly extended throughout Belgium, Germany, and Holland. Felix Platerus relates the case of a woman at Basle, whom he saw, that danced a whole month together.

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* Hecker's Epidemics of the Middle Ages, tr. by Dr. Babington, p. 87.

† Webster's History of Epidemics, vol. i. p. 225.

The "Limburg Chronicle" states that the love of dress was so extravagant shortly after the middle of the fourteenth century, that the priests lost no opportunity of denouncing it as the work of the devil; these fanatical revilings so intimidated the people, that the St. Vitus dancers acquired a morbid aversion to red colours as well as to pointed shoes, which came into fashion shortly after the plague. The ecclesiastics in many places regarded those persons who were affected with St. Vitus's dance as possessed; and practised exorcism for the cure, by reciting certain verses from the Bible; but writers have not noticed with what success. By some the disease was observed to recur every year at about the same period. It was doubtless propagated to a great extent by the mere sight, for according to Herder, gangs of idle vagabonds, who understood how to imitate to the life the gestures and convulsions of those really affected, roved from place to place, seeking a maintenance and adventures, and thus, wherever they went, spreading this disgusting spasmodic disease like a plague. Baglivi has given an account of similar symptoms arising from the bite of the tarantula, or venomous spider, in Apulia, and cured by similar means. "The disease," says he, "was very often counterfeited by the women, who in that country lived in solitude, for the purpose of enjoying the agreeable diversion of music and dancing."

Many and great as were the opportunities afforded by these epidemics of acquiring practical knowledge, the whole course of university education was so entirely scholastic, and every theory of medicine was so tainted with superstition and error, that in the vain attempt to elevate it to the dignity of a science, it was compelled to surrender its pretension to the more practical sciences of natural history and natural philosophy. Being thus thrust out of the category of sciences, physicians endeavoured to make it a practical art; but the acquaintance of the most learned was by no means exact or critical enough to protect them against sophistry and error, so that in the absence of correct data it was degraded into a coarse empiricism.* It also laboured under the great disadvantages of being subjected to academic formalities, and of standing in danger of ecclesiastical prohibitions. Anatomy, moreover, for its successful pursuit, required the power of obtaining human bodies for dissection, a deficiency in which was at the universities an insurmountable difficulty. The more these researches extended themselves, the more decidedly did they sink into the background at Oxford and Cambridge, until at last these institutions supplied only the empty forms of obtaining degrees.† Thus depending on conditions which the universities could not supply, medicine at length found its account in withdrawing from them to large and populous cities, where it was nurtured by other circumstances essentially necessary to its advancement‡; but Mr. Hallam's strictures on literature generally are applicable to medicine during the fourteenth and fifteenth centuries. "We should," says he, "if we mean to judge accurately, not over-value the fifteenth century, as one in which the human mind advanced with giant strides in the kingdom of knowledge. General historians of literature are apt to speak rather hyperbolically in respect of men who rose above their contemporaries; language frequently just, in relation to the vigorous intellects and ardent industry of such men, but tending to produce an exaggerated estimate of their absolute qualities."*

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* Newman's Huber, vol. i. p. 158.

† Ibid. vol. ii. p. 65.

‡ Ibid. vol. i. p. 158.

In taking leave of the fourteenth century it is impossible to form a very exalted opinion of the then existing members of the medical profession; for, with the exception of Mundinus in Italy, and Guy de Chauliac in France, we have ample testimony to show that they had but few of the virtues and all the failings of the faculty.

John of Gaddesden was a type of the class, and an excellent illustration of the tendency of the age. He gloried in secret practices, and was a charlatan of the first order. His remedies, too, are worthy of being recorded as curiosities in medicine. For loss of memory he recommended the heart of a nightingale, and for scrofula the king's touch. He had, however, the honesty to confess, that if the laity did but know his secrets, they would despise him and his art. It was doubtless with such a virtuous disquietude that he recommended his brethren to claim their fees before undertaking the cure of a disease.

Nor were the members of the university, which all men regarded as the first in Europe, more noble in spirit, more liberal in sentiment, or more disinterested in practice than the unworthy professor to whom I have alluded; for they were in a state of perpetual jealousy and hostility with the surgeons of the day.† It is painful to think that men like Pitard, Chauliac and Lanfranc should have been subjected to the persecutions of individuals whose collective intellectuality we may judge of by the history which Girodat has transmitted to us.

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* Hallam's Hist. of Literature, vol. i. chap. iii. sec. 141.

† Girodat, p. 20.

Surgery, however, according to the researches of Sprengel, was to a great degree in the hands of barbers,* who, notwithstanding the examination to which they were obliged to submit, were grossly ignorant; whilst the physicians, true to the bombast of underbred men, deluded themselves by thinking that they descended from their high estate if they gave a passing thought to so low and disgusting a subject as a surgical operation; but of this hereafter.

I have already adverted to the origin of Apothecaries, who by slow degrees established themselves over Europe.

We are informed by Beckmann† that the first apothecary of whom mention is made in England was one Coursus de Gangland, who was paid sixpence a-day in 1345 for attending on Edward III., whilst that monarch was ill in Scotland.

Early in the fifteenth century, an apothecary's shop was established at Stutgard; and at Basle, in 1440, a public physician was appointed for every imperial German city, with the allowance of an ecclesiastical benefice or canonry, in order that he might exercise a supervision over the apothecaries. No mention is made of them in France until 1484, when they were incorporated by Charles VIII., and subjected to an examination, although they were, generally, pastry-cooks as well as apothecaries.‡

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* "Le corps des chirurgiens était divisé en deux classes: les Chirurgiens de Robe longue et les Chirurgiens de Robe courte; la première comprenait les maîtres-es-arts, l'autre était formée par les barbiers."—*Portal, Histoire de l'Anatomie et de la Chirurgie*, vol. i. p. 343.

† Art. "Apothecaries," vol. ii. p. 132.

‡ Ibid.

Those who are fond of curiosities in medical literature, may realise the individuality of the English physician of the fourteenth century from the "Canterbury Tales" of Geoffrey Chaucer, whose acuteness of observation, and felicity of expression place him far above all other English poets of the middle age. The sketch which he therein gives of the "Doctour of Physick," his facile speech of both physic and surgery, but his manifest predilection for astronomy and magic, his course of professional reading, his frugal diet, his mode of life, even his very dress, is so admirably depicted, that, like a skilfully dashed-off portrait, it carries an assurance of truthfulness:

"With us there was a doctour of physik,
In al the worlde was ther non him lyk,
To speke of physik and of surgerye,
For he was groundit in astronomy.
He kept is pacient a ful gret del
In hourys by his magyk naturel;
Wel couth he fortunen the ascendent
Of his ymags for his pacient.
He knew the cause of every maladye,
Were it or hot or cold, or moist or drye,
Where they engendere, and of what humour,
He was a veray parfyt practysour.
The cause yknowe, and of his harm the rote,
Anon ye yaf, to the syk man his bote.

"Full redy had he his apothecaryes,
To sendyn him his droggis, and letewaryes,
For eche of hem made other for to wynne,
Her frenshepe was not nowe to begynne.

"Wel knew he the old Esculapus
And Diascorides, and eke Rufus,
Old Hyppocras, Lylye, and Galen,
Serpion, Razis, and Avycen,
Averois, Damascyen, and Constantyn,
Bernard, and Gadesteun, and Gillbertyn.

"Of his diete mesurable was he,
For it was non of superfluite,
But of great nuryschynge, and digestible.
His study was but lytyl in the Bible.
In sanguyn and in perse he clad was al
Lined with taffata and with sendal;
And yit he was but esy of dispence,
He kepté that he won in pestelence;
For gold in physik is a cordial,
Therefore he lovede gold in special."

It was during the fourteenth century that apothecaries were incorporated with grocers; and it was only in 1617 that they formed separate corporations.

CHAP. VII.

PROGRESS OF MEDICINE DURING THE FIFTEENTH CENTURY.

The fifteenth century was marked by many events which had great interest as connected with medicine. It may seem pedantic at the present time to associate the successive phases of our art with the course of religion, but when the great majority of practitioners were monks, who were more or less engaged in the contentions between rival popes on the one hand, and conflicting doctrines in philosophy on the other, it would be impossible to estimate the progress of medicine, without some slight notice of these feuds. All historians agree in depicting the clergy generally, during the fifteenth century, as debased by sensuality, ignorance, and superstition: the Benedictines and Augustinians, especially, appear to have indulged in all sorts of licentiousness and vice. But there were some individuals, conspicuous for their piety and learning, who were ardently desirous of general improvement. Wickliffe was one who had engaged the attention of Western Europe, and to whom, together with Huss and Wessel, may be ascribed the urgent demand for the Reformation which was eventually effected by Luther; and this had its effect on medicine: for when the infallibility of the Roman Pontiff was once questioned, the despotic authority of any other earthly potentate was as likely to be disputed; and, accordingly, it will be found that the tenets of Galen and Avicenna were as severely scrutinised, as was the power of the pope to sell indulgences.

The doctrines of Wickliffe were adopted by the University of Paris, with Jean Gerson, the chancellor, at its head. Meanwhile, a fierce contest had raged for a long time at Constantinople, between the partisans of Plato and Aristotle. This contention was transferred to the West by many learned Greeks, who had been compelled to abandon their homes in consequence of the invasion of their country by the Turks; and where they took refuge, both in France and Italy, they communicated a fresh impulse to the arts and sciences, and contributed to the same enlightenment, as did the Reformers in religion.*

The Aristotelian philosophy had generally prevailed since the time of its propagation by the Dominican monks in the twelfth century; but, early in the fifteenth, Genistius Pletho, a native of Constantinople, became a zealous advocate for Platonism, as allied to Christianity, and maintained a violent controversy with the Aristotelians, who also defended Christianity by the logic of their master. He was followed by Bessario, bishop of Nice, and Marsilius Ficinus, or Marsiglio Ficino, a protégé of Cosmo de Medici—Ficinus having been educated by Pletho. But, from his natural deficiency in judgment and taste, he disappointed his patron, although he influenced the medical school of Florence by impressing on it Platonic theories.

When Pletho had achieved success in reviving the Platonic philosophy, a body of erudite Greeks, under Theodore Gaza, Schlorius, and Faber, avowed themselves disciples of the Aristotelian philosophy, and occupied themselves most diligently in translating and diffusing the works of the Stagyrite.

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* Hallam's Literary History, chap. ii. p. 21.

But the advocates of Plato, under the patronage of the Medici, prevailed especially in Italy.

Whilst Ficinus and Picus were engaged in reviving Platonism, and Georgius Schlorius and Faber were as zealous followers of Aristotle, a Suabian, named John Reuchlin, or, as he was called, Capnio, professed and taught a mixed philosophy, compounded of Platonic, Pythagorean, and Cabalistic doctrines, to which many pious and learned Peripatetics gave in their adhesion, in consequence of the growing licentiousness of their own school. Fancying that they could not commit themselves to the direction of Aristotle, without hazarding their religious principles, they accepted the philosophy of Capnio, which they believed to combine the mysteries of Pythagoras (the most consonant, as they thought, with true religion) with the wisdom of Plato.*

Platonism, in its original purity, when its aim was lofty, although its arguments were weak, was peculiarly suited to men of imaginative and thoughtful minds. By its characteristic doctrine of ideas, independent of the objects which those ideas represent, it contributed less to improve than to corrupt the human understanding, and was highly favourable to the dreams of mysticism.† But, in the garbled form which Capnio taught, it tainted medicine with a still deeper tinge of romance and superstition than it had previously possessed; and, however much its pursuit may have appeared to engender free aspirations, and intellectual efforts, it really favoured Cabalistic rites, and pretended miracles. The Aristotelians, on the other hand, were close and accurate observers of natural phenomena, and, like their master, professed to avoid all deceptive views of the fancy, but followed rather a severe methodical, and strictly scientific course of enquiry, founded on data the truth of which they had ascertained by experience.

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* Rees's Cyclopædia, art. "Reuchlin."

† Encyclopædia Britannica, vol. xvii. p. 815, and vol. xix. p. 96. 8th edit.

To the contest between the opposing sects, and to the introduction of the study of the ancient classics generally, which occurred in the fifteenth century, must the revival of literature be referred; and, although Platonism found many advocates in England in the seventeenth century, still the Aristotelian philosophy prevailed in Cisalpine Europe, and gave a generous impulse to the pursuit of medicine.* Such at least, I think, is a fair deduction from the medical literature of the fifteenth century; for whilst those practitioners of our art who were known to be Platonists, occupied themselves in astrology, and commenting on Avicenna, others of Aristotelian tendencies composed monographs on the prevailing diseases, and so introduced the germs of future improvement. An attempt to substantiate this opinion would necessarily be too long a digression, in a work which professes only to notice those men who have either advanced the healing art, by the introduction of absolute facts and discoveries, or falsified it by engrafting notorious delusions.† I do not mean to assert that the former absolutely resulted from Plato, and the latter from Aristotle, but they appear like grafts growing from congenial stems, and differ only from their parent trunks by their different fruits.* Even at the present day, it is by no means uncommon to find men who are decided Platonists, and who entertain ideas which are effectual barriers to anything like a mutual understanding and reciprocal influence. Of all those, however, whose names have been quoted, Vincent Vianeus alone deserves particular notice as a pure surgeon, who, according to Grösse, was the first to discover and practise the art of restoring lost noses and lips, by means of portions of flesh transplanted from the arms of his patients; still, the precise details of what is known to us as the Taliacotian operation are not given; but, if both Grösse and Sprengel are correct, Vianeus was the originator of plastic surgery.†

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* If we compare Bonaventura with Aquinas, we shall see the decided superiority of the Aristotelic moralist over the tender enthusiast of the Platonic school. Encyclop. Metropol. vol. xi. p. 814.

† To any one who is interested in this question, the biographical sketches of Johannes Concorregius, Hugo Senensis, Johannes Mar-

It would be the more pleasing, if the above instance of ingenuity could be regarded as a feature of the age; but we have too good evidence that the very reverse was the case; and that quackery and superstition

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lianus, Bartolomæus Montagnana and his successors, Antonius Guainerius, Petrus Leonius, Hugo Bencius, Johannes Arculanus, Jacobus De Partibus, Johannes Matthæus Ferrarius, Antonius Galatæus, Alexander Benedictus, and Laurentius Laurentianus, on the one hand, and of Savonarola after his visit to the different European universities, of Vincent Vianeus, Felix and Thomas Plater, Valescus De Taranta, Theodorus Gresemundus, Wernerus Wollflinus, and Martinus Melerstat on the other, as recorded in "Grosse's Universal Lexicon," "Treheri Theatrum Virorum," the "Theatrum Italicum Virorum Literatorum Hieronymi Ghilini," and the "Dictionnaire de Biographie Universelle," will afford something like data for a rational conclusion.

* Encyclopædia Metropolitana, vol. ii. p. 813.

† Grösse's Vollständiges Universal Lexicon, art. "Vincent Vianeus."

prevailed to such an extent as to be universally felt and complained of, even at the period in question. Accordingly, in the English Parliament, held on the 2nd of May, 1421, a petition was presented, having for its object to restrain the practice of physic to such as had graduated in that faculty in the universities, or were approved of by those bodies. In the preamble, it was set forth as follows: "Forsomuch as a man hath three things to govern, soul, body, and worldly goods, revealed by the three sciences, divinity, physic, and law, these conynges sholde be used and practised principally by the most connying men in the same sciences. But many uncunning, and unapproved, practise physic to the great harm and slaughter of men." It was therefore ordered that the Lords of the King's Council should make such ordinances and punishments to those persons not approved (namely, those of physic, by the universities, and surgeons, by masters of that art) as might seem fit and necessary.*

The invention of printing by Guttenburg in 1455, by means of moveable letters, gave a fillip to the impulse which the study of the Greek classics had originated, and, of all other human inventions, rendered the greatest service to the triumph of knowledge and civilisation.† By increasing the number of copies of every work, it gave greater facility for the acquirement of information than had ever before been enjoyed, and rescued from the danger of destruction the accumulated knowledge of antecedent ages, which it will transmit as an imperishable inheritance to future generations.

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* Annals of Cambridge, by Charles Henry Cooper, coroner of the town, vol. i. p. 167.

† Hallam's Literature of Europe, vol. i. chap. iii. sec. xxi.

"It was," as Mr. Hallam has observed, "Minerva leaping on earth in her divine strength, and radiant armour, ready, at the moment of her nativity, to destroy her enemies."*

But whilst Greek erudition and printing thus stimulated the march of science generally, it is to be feared that medicine lagged behind, and apparently in consequence of the invariable tendency which scientific men acquire of mixing themselves up with the movements of their time; hence the dreams of the Platonists still nurtured the superstition which already existed, and made men more intent on the supremacy of their respective masters in philosophy than on the advancement of their own especial calling. The custom of idle speculation and theory was for a long time retained, whilst the more accurate induction from facts and experiments was disregarded, except by the few whose names have been mentioned; and most of them clung to the prevailing faith in the efficacy of charms and precious stones as remedies against diseases, although their better sense appears to have prevailed in the works which they wrote, and the controversies which they sustained, relative to the nature and treatment of the epidemics which are recorded as having invaded Europe during that century.

Of these the hooping cough may be mentioned, which, according to the investigations of Sprengel, first appeared in France as an epidemic in the year 1414. From the commencement it assumed an infectious form, and was very fatal, sparing neither age nor sex. It appeared a second time in 1510, when it was also confined to France; but on its third invasion, in 1555, it extended to Germany; and on its fourth appearance, in 1580, it spread over the whole of Europe, and committed great ravages. In Rome alone 9000 children were said to have perished in six months, and from its very first irruption it was more destructive to the young than to adults.

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* Hallam's Literature of Europe, ch. iii. sec. xxii.

Simultaneously with hooping cough frequent outbreaks of pleurisy, for the most part severe in character, though low in type, occurred during the fifteenth and sixteenth centuries; both diseases being attributed to unseasonably wet and cold summers.

The discussions which arose relative to the treatment of pleurisy, as well as the conflicting opinions which were supported by men who considered themselves competent to speak authoritatively on the matter, afford a remarkable instance of the futile and unsatisfactory nature of all such hypothetical contests, but give us an excellent insight into the mode of thinking and reasoning on the nature and treatment of disease at that day.

It is obvious that all the most important functions of the body, as well as their disordered states, were supposed to result from the veins, for the relief of which, and as to the best mode of bringing that relief about, I purpose showing how doctors differed then as they differ now. But to make the question as comprehensive as possible, I must refer back to the time of Hippocrates, and anticipate the course of events to show the various forms which the disputed point assumed up to the end of the sixteenth century, when Harvey discovered the circulation of the blood. "Cuique professori suâ in arte credendum est," is undoubtedly a good maxim, but, like all other propositions, it has its limitation. The wisest and best of us are apt to fall under the domination of some fixed idea, and when the mind is concentrated upon some particular dogma, its capacity of judging of the doctrine in which that dogma is included in relation to others is impaired. And thus it was in the controversy which began in the fifteenth century with regard to venesection in pleurisy. The question raised was simply this: Should bleeding be practised near to or at as great a distance as possible from the seat of disease? The former opinion had been held by Hippocrates, and was known as the derivative system, and had therefore the additional importance which was then attached to the opinion of the ancients. It fell into desuetude, however, and gave place to the latter or revulsive system, which was adopted by the Arabs, who traced it to the Pneumatists, and it was almost universally practised up to the end of the fifteenth century.

Although Hippocrates has the credit of originating the theory of revulsion and derivation, his explanation of it is by no means so clear as that of Galen, who, like Hippocrates, attributed the cause of most diseases to a flux of noxious humours on the parts affected. By the term revulsion, he understood the act of communicating to a flow of humours a course directly contrary to that which it had before; and by derivation the drawing off of a collection of humours (per canales vicinos derivatio); an expression which was probably borrowed from the custom of cutting drains in order to draw off water from lakes and rivers. In the selection of a vein for bleeding, Hippocrates gave the preference to such vessels as he imagined to be distributed to the seat of disease, with the view to the better taking off any surcharge of humour from such part. Thus in describing the largest blood-vessels as connected with the spine of the back in their course to the thighs, legs, and feet, he adds this practical remark; "We ought therefore, in pains of the back and hips, to bleed in the hams or external ankles." Galen prescribed a code of practical rules relating to the theory of revulsion and derivation, as well as to the selection of blood-vessels for venesection in particular diseases. When writing on pleurisy, he says, "If there be pain in the clavicles, or heaviness in the arms or round the breast, or above the diaphragm, it is of service to open the internal vein of the arm;" by arguments deduced from the intimate communication which he supposed to exist between that particular vein and the lungs. He also remarked that "it was a rule with him to endeavour to exhaust that particular part which happened to be loaded with the inflammation, especially in acute diseases." But we first meet with indications of an argument for the revulsive system in Celsus, where he says (book ii. cap. 10), "If blood is to be drawn to relieve a part, then it should be drawn from the part itself, or certainly from that nearest to it." "*Neither am I ignorant that some say it ought to be drawn as far as possible from the disordered part, for that on this plan the revulsion will be effected; while on the other, the course of the blood will be directed to that part which is distressing the system.* But this is incorrect; for it first draws out the circumjacent blood, and afterwards the blood flows from parts more distant only proportionally to the loss of it; and when the bleeding is stopped, it comes there no more, because it is no longer drawn to that quarter."

It was supposed by the advocates for the system of derivation that nature was apt to set up local and active congestions, towards which noxious humours flowed, and that by bleeding in the immediate neighbourhood of the disease the humours only were withdrawn.

The revulsionists, on the other hand, thought that local diseases originated by a kind of metastasis, from a distant source where the noxious humours were first formed; and that by bleeding at a distant part the humours were drawn back towards that part and so expelled; whilst by bleeding in the immediate neighbourhood of the disease to which the humours in question had a natural tendency to flow, they were drawn thither still more, and the disease in consequence was aggravated.

This latter opinion, as already stated, was universally accepted up to the latter part of the fifteenth century, when the more diligent study of Hippocrates and Galen caused the revival of the doctrine of derivation, which was advocated by Plater in his work on fevers, about 1490.

It may be further premised that a great distinction was made between the different stadia or phases of disease; whether, for instance, the disorder was forming or formed,—whether the humours were flowing to, or already impacted in the part affected. According as one or the other of these circumstances attended the disorder, it was seized on, as we shall presently see, as an indication of cure either by revulsion or derivation. These crude notions, as well as all others which were entertained relative to vital phenomena, were necessarily conjectural, because of the entire ignorance of the course of the circulation, and of the special functions of the lymphatics, and of the nervous system.

Early in the sixteenth century (1514) a severe epidemic pleurisy raged in Paris, when one of the most celebrated physicians of that city, Pierre Brissot, boldly advocated, and practised the derivative system, by withdrawing blood from the immediate neighbourhood of the affected part, and with great success. To a mind free from all prejudice in favour of any hypothesis, nothing seems so likely to remove pain attending inflammation, as the withdrawal of morbid humours immediately from the parts where the vessels are evidently thus overloaded. By such an argument, and by the happy result of his practice, Brissot gained over two distinguished contemporaries, Drs. Villemore and Helin. His adversaries, however, obtained a legislative prohibition to the working out of his system, and Brissot went off to Portugal, to pursue his favourite study of natural history. In 1518, a similar epidemic broke out at Ebora, where he again recommended the Hippocratic doctrine of derivation, and the practice was as successful as it had been in Paris. But it excited the jealousy and enmity of Dr. Denys, a Portuguese physician and revulsionist. Whereupon a paper war ensued, to the manifest advantage of Brissot. He exposed the fallacy of selecting the vein in the right arm, when the left side was affected, as being more distant from the seat of disease, but fell into an equal error himself, in assigning, as his reason for bleeding as near to the diseased organ as possible, that the noxious humours only were evacuated; whilst, by bleeding at a distance, good blood also was withdrawn. He, moreover, maintained that a revulsion could only be effected by a rapid and sudden loss of blood, and not by the drop-by-drop system which many of the revulsionists pursued, and which was said to have been most successfully practised at Zurich. It was not, however, until after his death, that all his arguments in favour of derivation were published by his friend Luceus of Ebora, in the celebrated work entitled, "Apologetica Disceptatio de Venâ secandâ in Pleuritide," which produced a multitude of converts. The dispute waxed warm, and extended into Spain, where the University of Salamanca was appealed to, and decided in favour of Brissot's views. The revulsionists, however, irritated by the decision of the professors, and willing, in this matter at least, to place no limitation on the power of the Lord's anointed, declared their belief in his divine right and infallibility, and supplicated Charles V. to judge and decide between them: premising, however, that the heresy of Brissot was as great in medicine as was that of Luther in theology. Unfortunately for their cause, the son of Charles Duke of Savoy had just died of pleurisy, after having been bled according to the method of the revulsionists, and the cause of Brissot and derivation gained immensely by it. The endless question was taken up by Andrew Thurinus, physician to Pope Paul III., who fancied that at the beginning of an inflammation, the noxious humours were small in quantity, and that, therefore, a small revulsive bleeding at a distance was the safest and best remedy.

Cæsar Optatus followed with a similar hypothesis; but in his work he described the practice pursued in different places. Thus, at Venice, as at Zurich, it was the custom to bleed from a cutaneous vein of the foot; at Florence and Bologna from the basilic vein of the arm, but on the side opposed to that of the disease; whilst at Pavia, the same vein on the affected side was selected. Conrad Gesner, Horace Augenius, Gonthier of Andernach, and John Baptist Sylvaticus, are also recorded by Sprengel as pure revulsionists. Incapable of fully satisfying themselves on either point, some practitioners embraced a middle course, on the supposition that, at the beginning of an inflammation, the noxious humours were flowing towards the diseased organ, and that in the decline they were impacted in the affected part. So they bled at a distance in the beginning, and pursued a derivative course in the advanced stage of the disorder. Louis Panizza and Mariano Santo de Barletta were the advocates of this system, and they, too, professed to be successful in their treatment.

Victor Trincavelli, a physician of Venice, was a formidable opponent to the system of "derivation," as advocated by Brissot. In his celebrated work, "Concilia Medica," etc. which was published in 1587, there is a chapter entitled, "De Vena Pleuriticis et aliis Viscerum inflammationibus secanda," showing great research, an intimate knowledge of all that had been written on the subject before, and exhausting every argument to prove the fallacy of Brissot's views. He refers to the work of Andrea of Turin, "De curatione Pleuritidis per Venæ sectionem (1537)," and to Matthæus Curtius, who wrote in 1539, and was regarded as an authority, as well as a disciple of Brissot, to show that even Hippocrates drew blood from remote vessels, and quotes this passage on pleuritis: "Mittendus sit sanguis, aut in cubito opposito, aut in crure ejusdem lateris." Although a stanch revulsionist, he recognised two forms of revulsion; the one absolute, the other relative. In other words, he adopted an intermediate doctrine; for what he called absolute revulsion was simply the system of bleeding at a remote part, for the purpose of communicating to the flow of noxious humours a course directly contrary to that which it had before; lest, as he said, bleeding near the disease should attract the humours, and so aggravate the pain; whilst the relative revulsion was, in point of fact, nothing more nor less than the Hippocratic system of derivation, which he advocated in most cases, except general plethora and pleurisy. As Brissot appealed to his successful practice and experience, so also did Trincavelli, and from his time the intermediate course began to be adopted. Thus, the doctrine of revulsion gradually lost ground, and but few physicians implicitly followed the strictly derivative system of Brissot.

It is, of all things, the most difficult to separate the merits of a cause from the demerits of its upholders; and the converts to Brissot were of so equivocal a character, that his system suffered in consequence of its dubious instruments. Matthew Curtius, for instance, who was quoted by Trincavelli, although professedly a follower of Brissot, when seized with pleurisy himself, desired to be bled, in accordance with the revulsive theory of the Arabs, and in opposition to his own.

Jeremy Drivière again, a celebrated physician of Louvain, where the doctor's cap was exclusively conferred on men of superior talent, was regarded by Sprengel as a supporter of Brissot, although holding a middle opinion between the latter and the Arabs; but it is impossible to read his treatise, "De Missione Sanguinis in Pleuritide," &c. without feeling that he aimed at sustaining the doctrine of the Arabs as opposed to the opinion of Hippocrates; for these are his own words: "Et quia universa fere vis rationum eorum in hoc videtur sita, quia inter initia inflammationis revulsioni maxime occurrendum est; et revulsionis ratio id expectare videtur, ut procul et in contrarium succi defluentes retrahantur, quod Galenus docet quarto et quinto libro de Methodo curandi morbos. Sanguis vero, e venâ in eodem latere missus, succos defluentes neque procul, nec in contrarium convertit, cum ex eâdem parte et prope affectum locum profluat; quamobrem concludunt sectionem venæ in eodem latere non esse remedium, quod initiis inflammationum sit congruum." Leonard Fuchs was an enlightened disciple of Luther, an earnest reformer, a zealous student of natural history, and a consistent advocate of the opinion of Brissot. He engaged with great bitterness of diction in the dispute of the day with the most celebrated of his contemporaries, especially with Drivière, and further enunciated a doctrine which he professed to derive from the words *καθ' ἵξιν* of Hippocrates, attributing to the uninterrupted continuity of the longitudinal fibres of the veins an expulsive influence on the noxious humours of disease; and he contended that venesection should be practised within the sphere of such influence. To reconcile his opinion, however, with that of Trincavelli, which had become popular, he affirmed that revulsion and derivation might be effected by one single opening of a vein: as, for example, by bleeding from the basilic vein of the right arm in cases of pleurisy of the right side. He most ingeniously represented revulsion to be effected by withdrawing the humours at a distance, and in the natural course, as he thought, which they took from the cava to the basilic; whilst at the same time derivation was accomplished, by reason of the extension of the longitudinal fibres of the vena cava, to the right basilic. This theory, which was an obvious compromise, was violently opposed, as illusory, by John Argentier, of Castelnuovo, by Thomas Erastus, and by Thaddeus Dunus. The latter, like Fuchs, was a reformer, in consequence of which he was banished from his native town, Lucarno, and fled to Zurich, where he became the intimate friend of Conrad Gesner, by whom is recorded the successful practice of the revulsive system after that of derivation had signally failed, in the severe epidemic pleurisy which broke out in Switzerland in 1564. The discussion was taken up by the most celebrated anatomist of the sixteenth century, Gabriel Fallopius or Fallopio, who exposed the sophistry of Fuchs by demonstrating the inextricable interlacement of the longitudinal and circular fibres of the veins, and the consequent impossibility of attributing the expulsive action to one set more than to another.

At this stage of the controversy Andrew Vesalius, the son of an apothecary at Brussels, discovered, about 1538, the termination of the Vena Azygos, which receives its blood from the intercostal and bronchial veins, in the vena cava; and hence inferred (being an advocate of the derivative system) that in pleurisy blood should be drawn from the right arm, because of the near connection between its vessels and the vena azygos; and published his famous "Epistola docens Venam Axillarem dextri cubiti in Dolore laterali secandam." It is a notable example of the necessity of explaining nature by nature herself. He took for granted the then prevailing notion, that the blood flowed from the heart through the veins to the extremities, whereas the very reverse is the fact; and so deeply rooted was this error in the minds of all anatomists that, although Jean Baptiste Cannani, shortly after, discovered the existence of valves at the opening of the vena azygos into the vena cava, and the discovery was followed up and confirmed in 1547 by Joannes Rodericus Amato, a Portuguese Jew, yet they remained blind to the true function of the valves in question, and actually resorted to experiments to show that they prevented the reflux of blood from the vena azygos into the vena cava, instead of the reverse.* It is difficult to imagine how Amato accomplished his experiments; but such was the force of prejudice, and the reverence for what Galen had said, that what theory required, experiment, somehow or other, was made to demonstrate.

Fallopius, Vesalius, Eustachius, and all the great anatomists of the day, stoutly repudiated the existence of the valves, and by so doing discarded the most significant evidence, which, if rightly followed up, was likely to lead Vesalius to the discovery of the true course of the circulation of the blood.† But all men at that time were more intent on the rival dogmas of revulsion and derivation; and whilst the revulsionists paid homage to the infallible decrees of the Arabians, and regarded Rhazes and Avicenna as the prophets of truth, the followers of Brissot entertained as lively a reverence for Hippocrates and Galen.

Ambroise Paré, the father of French surgery, and Nicholas Monardes, a distinguished physician of Seville, subscribed to, and founded their practice on the doctrine of Brissot, as did many others, and doubtless from a sense of serious and honest conviction; but it is to be feared that not a few professed the same opinions with a view to be esteemed sapient in Greek lore, seeing that it was the fashion of the day; and the cause in question was in close alliance with it. And thus the controversy held on, even after the valves in the veins generally were discovered by Hieronymus Fabricius of Aquapendente in 1574, of which it will be my duty to speak hereafter. In the mean time, the names of the chief disputants will be found in Sprengel's "History of Medicine," and an excellent analysis of the question is contained in a small work by Giles Watts, M.D., published in 1754, and entitled, "A Dissertation on the ancient and noted Doctrine of Revulsion and Derivation, to set forth the absurdity of the principle on which the notion of Revulsion was originally founded."

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* Sprengel, vol. iii. p. 55.

† Ibid. vol. iii. p. 56. I may here observe, although it will be necessary to enter more at large on the subject hereafter, that Portal, in his "Histoire de l'Anatomie," &c. (vol. i. p. 339), states that the valves of the veins were first discovered by Etienne, and described by him in 1536. Cruveilhier also bears testimony to the same fact.

In 1619, Harvey first publicly announced his brilliant discovery, which no succeeding one can ever supersede or obscure; and in 1628, he published, for all succeeding ages, his celebrated "Exercitatio Anatomica de Motu Sanguinis."

I have endeavoured to describe the order and succession of circumstances, as far as I have been able to collect them, under which each dogma in therapeutics had derived its birth and support, from which we may arrive at some notion of the operations of the human mind, at a period when it was groping in the dark and unaided by this latter discovery.

If all the visitations of epidemic pleurisy, which occurred during the period when this controversy was carried on, could be satisfactorily reconsidered, it is highly probable that the dissonance of opinion might be explained by the type of disease which appeared; for, according to Webster, it was observed that the pleurisy and peripneumony which supervened when plague prevailed, assumed a low character, and invariably terminated fatally when bleeding was practised. Sprengel also notices the same fact.*

In 1485, the course of human events was diversified by the occurrence of a new disease, which appeared to spring out of the peculiar and exceptional condition of the English climate. The ordinary humidity of the atmosphere was increased by the incessant rains which had fallen for the five preceding years; added to which, the habits of the people were such as to be directly injurious to health. "They were," says Hecker, "not accustomed to cleanliness, moderation in their diet, or even comfortable refinements. Gluttony was common among the nobility as well as among the lower classes;† all were immoderately addicted to drinking the luscious Greek wines, especially Cretan wine, Malmsey and Muscat, and the manners of the age sanctioned this excess at their banquets and their festivities. If we consider that the disease mostly attacked strong and robust men—that portion of the people who abandoned themselves without restraint to all the pleasures of the table—while women, old men, and children, almost entirely escaped, it is obvious that a gross indulgence of the appetite must have had a considerable share in the production of this unparalleled plague." "The sweating sickness, as it was called, was a violent inflammatory fever, which, after a short rigor, prostrated the powers as with a blow; and amidst painful oppression at the stomach, head-ache, and lethargic stupor, suffused the whole body with a fetid perspiration."‡

Various accounts of the disease, and the consternation which seized all the people on the first outbreak of it, have been most forcibly described in the chronicles which have been transmitted to us by the writers of the day.* Thus, in Grafton's "Chronicles of England," we read that, in 1485, "a new kynde of sicknesse came sodainely through the whole region, even after the first entering of the kyng (Henry VII.) into this isle, which was so sore, so paynefull and sharp, that the like was never hearde of, to any man's remembrance before that tyme. For sodainely a deadly and bourning sweate invaded their bodies and vexed their blood, and wyth a most ardent heat, infested the stomacke, and the head greevously, by the tormenting and vexacion of which sicknesse men were so sore handled, and so painfully pangued, that if they were laid in their bedde, beyng not able to suffer the importunate heate, they cast away the sheetes, and all the clothes lying on the bed." "Other were so drye, that they dranke the cold water to quench their importunate heat and insatiable thirst. All in maner as sone as the sweate tooke them, or within a shorte space after, yelded up theyr ghost. So that of all them that sickned, there was not one amongest an hundreth that escaped. At the length, by studie of phisitions, and experience of the people driven thereunto by dreadful necessitie, there was a remedie invented. And it was this: If a man on the day-time were plagued with the sweate, then he should straight lie downe with all his clothes and garments, and lye still the whole xxiiij houres. If in the night he were taken, then he should not rise out of his bed for the space of xxiiij houres, and so cast the clothes that he might in no wise provoke the sweate, but so lye temperately that the water might distill out softly of the owne accorde, and to abstayne from all meate, if he might so long abstayne, and suffer hunger, and to take no more drinke, neyther hote nor colde, then wyll moderately quench and delay his thirstie appetite. And in this his amending, one point diligently above all other is to be observed and attended, that he never put his hand or foote out of the bed to refresh or coole himselfe, the which to doe is no lesse payne than short death."*

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* Sprengel, vol. iii. p. 88.

† Hecker's Epidemics, p. 187.

‡ Ibid. p. 181.

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* Hall's "Chronicles," containing the History of England, p. 425.

Again, in Holinshed's "Chronicles of England, Scotland and Ireland," it is related—"In this same yeére (1485) a new kinde of sickenes invaded suddenlie the people of this land, passing through the same from the one end to the other. It began about the one and twentith of September, and continued untill the end of October, being so sharpe and deadlie, that the like was never heard of to aníe man's remembrance before this time."† Robert Fabyan notices it in the following terms: "And upon the xj day of Octobre nexte folowynge, than beynge the swetynge syknesse of newe begon, dyed the sayd Thomas Hylle than of London mayer, & for hym was chosen as mayer sir Wyllyam Stokker knyght and draper, which dyed also of the sayd sykenesse shortly after; & then John Warde grocer, was chosen mayer, which so continued tyll the Feeste of Symonde and Jude folowynge."‡ Hecker records a second, but less severe attack in 1506§, of which John Hardyng in his

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* Grafton's Chronicles, or History of England, vol. ii. p. 160.

† Holinshed's Chronicles of England, Scotland, and Ireland, vol. iii. p. 482.

‡ The New Chronicles of England and France, by Robert Fabyan, p. 673.

§ Hecker's Epidemics, p. 197.

"Chronicles" says, "Howbeit by y^e reason of the remedy y^t was inuēted for it y^e laste time before it dyd y^t lesse hurte."[*] In Hall's "Chronicles" it is spoken of in connexion with an infirmity of the king, which had returned every spring: "And because for the most part, the harme and evell that chaunceth to the prince, is parted and communicated to his subjectes and people, the olde sweatynge whereof you heard before amongest the commons of the realme, came again."[†] A third also occurred in July, 1517, which was more destructive in the number of its victims, more severe in its character, and more rapid in its course than either of the two preceding outbreaks: so much so that among the lower classes who lived crowded together in the city, the deaths were innumerable, and very many of the higher classes were cut off without any premonitory symptoms; so that between perfect health and death there lay but a brief term of five or six hours.[‡] But in neither of the first two outbreaks did the disease extend beyond England, or rather beyond the English; for although in the epidemic of 1517 it was extended to Calais, yet, curiously enough, it was confined to the English inhabitants[§]—making obvious what Hecker has stated, that the predisposing causes of the sweating sickness lay in the habits of the English themselves, whose intemperance, like most other besetting sins, was covered by a display of religious zeal. Large draughts were drunk in honour of Christ, the Virgin, and each of the twelve Apostles; and, when these were exhausted, they ransacked the list of venerated Saints whose memory they pledged.[*] The intercourse between England, Holland, and France was very frequent; yet was there not a single case propagated to either country, except to the English inhabitants of Calais, who, like the rest of their countrymen, were greatly addicted to coarse gluttony and nocturnal carousings.[†]

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[*] Hardyng's Chronicles, p. 550.

[†] Hall's Chronicles, containing the History of England, p. 502.

[‡] Hecker, p. 182. Hall, p. 592.

[§] Ibid. p. 211.

Again, the epidemic occurred in 1528, when it was still more general and, if possible, more severe, justifying the epithet which was given to it of "The great mortality." It is reported by Hall and Fabyan, during the following year it extended into Germany and the greater part of Northern Europe, where the alarm which prevailed in consequence bordered on maniacal despair.[‡] The last attack was in 1552, whereof, says Fabyan, "there died in the first weke eight hundred persones, and then it ceased, thanks be to God."[§] On this occasion the banks of the Severn were the focus of the malady, whence it was diffused in every direction, and then again it was observed that it uniformly spared foreigners in England, but followed the English into foreign countries.[||]

The silence of English medical writers on the disease is perfectly inexplicable, unless we accept Hecker's reason, that, as they did not find it noticed by their revered masters, the Greeks, they were, generally, too ignorant to give a satisfactory account of it, and so they left it untouched. Erasmus, a shrewd observer of the habits of the English during the sixteenth century, was, probably, not very far from the truth in imputing the frequent visitations of the plague, as well as of the sweating sickness, to the filthy condition of the houses generally: so bad were they, that he was deterred from accepting the splendid offers of Henry VIII. and Cardinal Wolsey to induce him to fix his residence in England.*

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[*] Strutt's Chronicles, vol. ii. p. 264.

[†] Hecker, p. 213.

[‡] Fabyan, p. 699; Hall, p. 750.

[§] Fabyan, p. 711.

[||] In reading the "Chronicles" from which we have quoted, the thought naturally suggests itself that, in these early days of our literature, authors dealt so freely with their orthography, that if a correct method of spelling, if any such there were, did not present itself to the mind, they adopted an arbitrary one; and we are given to infer as much from some books which William Caxton translated into "this rude and symple Englyssh;" as, for instance, in the "Polycronycon imprinted by him, after having somewhat chaunged the rude and old Englysshe, that is, to wete, certayne words which in these days be neither voyd ne understanden." Lond. 1842.

Whilst the profession was agitated by the polemics of the Sangrados, a new continent was discovered, a new era was opened to the destinies of the human species, and an unbounded field presented itself for the exertions of the most sanguine activity. In 1492, Christopher Columbus first sighted America, and, shortly after, Francis Hernandez, a physician of great repute, was sent out by Philip II. to make observations, and to report on the natural productions of Spanish America; and the result was (though some few years after his death†) his work, entitled "Nova Plantarum, Animalium, et Mineralium Mexicanorum Historia," wherein a long list of new medicines is contained. This was soon followed by another work, from the pen of Nicholas Monardes, containing an account of the medical substances imported from America, which was translated into French by Le Ecluse, and into English by John Frampton, merchant, with the following inflated title: "Joyfull newes out of the new founde worlde; wherein are declared the rare and singular vertues of diverse and sundrie herbs, trees, oyles, plants and stones; with their applications, as well to the use of physic as chirurgerie, the saied beyng well applied bryngeth such present remedie for all diseases as maie seem altogether incredible; notwithstanding by practize founde out to bee true." Englished from the Spanish, 1577. Another, and a more important work, appeared early in the sixteenth century by Monsignor Giovanni Battista Ramusio*, embracing the fullest and most authentic records of the labours of these pioneers in the New World. In this latter work, allusion is made to the discovery of a spring in Florida by Juan Ponce de Leon, in 1508, who, as Mr. Bancroft remarks in his "History of America," "had heard and believed the tale of a fountain which possessed virtues to renovate the life of those who should bathe in its stream, or give a perpetuity of youth to the happy man who should drink of its ever-flowing waters."† So universal was this belief, that it was credited in Spain, not by all the people and the court only, but by those who were distinguished for virtue and intelligence. Nature was to discover the secrets for which alchemy had toiled in vain; and the elixir of life was to flow from a perpetual fountain of the New World, in the midst of a country glittering with gems and gold. But Ponce de Leon was destined to remain an old man, and prematurely so, by the furrows which hard service had imprinted on his cheeks. "He desired immortality on earth, and gained its shadow." *

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* A magnificent apartment, a yearly pension of 600 florins, and a benefice that produced yearly 100 marks, were not sufficient to counterbalance the disgust he felt at the incommodious and bad exposition of the houses, the filthiness of the streets, and the sluttishness within doors. The floors are commonly of clay, strewed with rushes, under which lie unmolested an ancient collection of lees, grease, fragments, bones, spittle, excrements of dogs and cats, and everything that is nasty.

† By some curious accident the manuscript of Francis Hernandez was lost, and appeared some years after the death of the author, when it was published. It was dedicated to Philip II., and was in the library of Cardinal Franc. Xav. de Zelada.

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* Racolta delle Navigationi et Viaggi da Mon. Gio. Battista Ramusio. His words are, "Et in questo tempo si divulgo quella favola del fonte, che faceva ringiovenire, et tornare giovani et freschi i vecchi."

† According to a tradition current among the natives of Puerto Rico, an island of the Bahama group, called Bimini, contained this

Connected with the discovery of America is a curious and interesting question, which relates to the origin and spread of one of the most awful diseases which has ever afflicted mankind; and which points in a remarkable manner to the public morals of the day. Morality, however, is a matter rather of sentiment than of fixed rule; and the proverb which declares "ce qui est vice au nord est vertu au midi," determining as it does that the axiom has the sanction of common sense, as well as of common opinion, may in some degree serve as an apology for, as well as an explanation of the fact, that as soon as the subject is noticed in medical literature we find it recorded that sovereigns and serfs, as well as princes and priests, were suffering the penalty of one common delinquency.

Towards the end of the fifteenth century an observa-

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fountain, in search of which Ponce de Leon visited every island, and drank of every fountain, river, and lake until he discovered Florida, which he so named in consequence of the discovery being made on a Palm Sunday, and the ground being covered with flowers, "Pascua Florida." Penny Cyclopædia, art. "Ponce de Leon."

* History of the Colonisation of the United States, by George Bancroft, vol. i. chap. ii. pp. 32–34.

tion was made by Philip Gabriel Hensler, that the dreadful disease, which was known as leprosy (Lepra nodosa), had gradually ceased to exist; but that another and milder species still continued, more especially in Germany, Holland, and Spain.*

As Lepra decreased, another disease, of an equally formidable character, to which the name of Syphilis was given, quickly increased†; and possessing as it did many of the characters of lepra it was thought by some, as by Gordonius, John of Gaddesden, Gul. de Saliceto, and others, that the disease was known to the Greeks and Arabs, though imperfectly described and represented under the names of the different kinds of lepra, and other cutaneous affections; and that the one had been transmuted into the other. But Nicholas Leonicenus first declared that it was altogether a new and distinct disease‡, and Leonard Fuchs distinctly affirms that it was a disease newly imported from America, in 1493, and that it was a mistake to confound it with any pre-existing cutaneous affection. It was moreover admitted, by the most learned and experienced physicians, to be a new disease of modern origin in Europe, and one which neither Greeks nor Arabs knew of.§ Le Clerc observes, that "if the distemper had been ancient it must have been noticed, if not by practising physicians, by the poets at least; for so fruitful a subject would never have escaped the raillery of Dante, Petrarch, and Boccacio."*

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* Sprengel, vol. iii. p. 62.

† Ibid. vol. iii. p. 66.

‡ Leoniceni (Nicolai) de Epidemiâ quam Itali Morbum Gallicum, Galli vero Neapolitanum vocant, Liber 4to. Venetiis, in Domo Aldi Manutii, 1497. This treatise is generally considered to have been the first work printed on the subject. M. Renouard and Sprengel pronounce it to have been so; but it was preceded by the poem, in Latin and German, of Sebastian Brant, and by the work of Grunpeck: "Eulogium de Scorra Pestilentiali sive Mala de Franzos." Item, Joseph de Grunpeck de eadem Re. 4to, Augustæ, 1496.

§ Astruc, De Morbis Venereis, trans. by W. Barrowby, vol. i. pp. 2, 3.

Torella, physician to Cæsar Borgia, lived and practised at its first outbreak, and asserted that it was not the same disease, nor a modification of the same as that which had been so beautifully described by Aretæus as Elephantiasis; but a new disease, which he attributed to a peculiar conjunction of the planets. Also Basil Valentine, who described it as the new disease of the soldiers (neue Krankheit der Kriegsleute) gives additional evidence to the above.†

Again, Fracastor, in his work entitled "De Morbis Contagiosis," observed that elephantiasis had become so rare that "nesciverunt quidnam esset elephantiasis, nisi hic morbus, quem Gallicum appellaverunt." Still it had not altogether disappeared; for in 1520 it was common both in Holland and Germany, and was attributed, by Roderic de Fonseca, to the sour cabbage, cheese, and bad beer, which the inhabitants largely partook of. Nor had it altogether passed away in France; for Louis XIII., as late as 1626, commanded two physicians, David and Juste Laigneau, to review all the truly leprous, and to separate them from other diseased persons; and subsequently Louis XIV. set apart the Hospital St. Mesmin, wherein leprosy ceased to exist as an epidemic.‡

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* See also Astruc, vol. i. pp. 4, 5.

† Histoire de la Chimie, par le Dr. Ferd. Hoefer, vol. i. p. 454.

‡ Sprengel, vol. iii. p. 63. Lemnius (Levinus), who gave implicit credence to all miraculous tales of his day, wrote a book entitled "De Miraculis Occultis Naturæ," wherein he states (lib. ii.

Those physicians who lived and wrote at the close of the fifteenth and beginning of the sixteenth centuries agreed in the opinion that syphilis was brought into Europe as above stated. Coradinus, in his "Opusculum de Morbo Gallico," published in 1497; Gaspar Torella, physician to Pope Alexander VI., in 1500; Jacobus Cataneus, 1516; Peter Maynard, in 1518; Gonzalvo, in 1535; and Gabriel Fallopius, in 1564,—bear witness to the same fact; and Antonius Musa Brassavolus, who lived and practised at the time, even recites the particulars of its first introduction: "In April, 1494," he says, "Bartholomew Columbus, the brother of Christopher, arrived in Hispaniola (Dominique) with three ships, which returned to Spain in the same year, with P. Boyle, a Benedictine monk, and Pedro de Margarit, a Calabrian gentleman, severely affected with the distemper."

In 1494, Charles VIII., king of France, invaded Italy, and entered Naples in February, 1495; he returned to France in October of the same year, leaving behind him Gilbert, Count de Montpensier, with 6000 men, many of whom were then affected. The father of Gabriel Fallopius was with Charles at Naples, and communicated to his son an account of the first appearance of the disease. But each nation to which it was imputed denied the charge of having first propagated it, and each indulged in recriminating its neighbour; for, says Gabriel Fallopius, "Itali Gallicum morbum

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chap. lii. p. 269), that in Holland the public censors, who were deputed to detect and set apart the leprous, determined the existence of the disease by throwing into the urine of the suspected person a little of the oxidated skimmings of lead (massicot). If it sank, the person was judged to be healthy; but if it swam, the individual was thought to be affected with lepra.

vocant; Galli scabiem, vel morbum Italicum, vocant*; vocant quinetiam Hispanicam scabiem, quoniam affectus ab Hispanis communicatus est Germanis."

Sydenham thought that its origin might be referred to the coast of Guinea, or to some portion of the negro country thereabout; under the supposition that Yaws (an epidemic disease of Guinea) and syphilis were modifications of one and the same disease; but in an article on yaws in the "Cyclopædia of Practical Medicine," Dr. Kerr has shown the distinctive characteristics of both diseases, and that they differ.

Fernel, who published his "Universa Medicina" in 1580, informs us that many theologians believed and inculcated the doctrine that the disease was a judgment from the Almighty to testify against the sins of the nations; whilst the astrologers generally attributed its appearance to the peculiar constitution of the planets and two eclipses of the sun.

One of the most careful investigators and voluminous writers on the subject was John Astruc, physician to the king of France, and to Augustus II. of Poland, who published a treatise in 1737, containing an account of the original propagation and contagion of the distemper.† Making use of an argument like that of Le Clerc, he assumed that if it had been known to the Greeks or Romans, it would have been noticed by Horace, Juvenal, Persius, Catullus, Martial, or Petronius; but all are silent on the matter. He then shows that the disease was common in the Antilles when discovered by Christopher Columbus, and especially in the island of Hispaniola, which was subsequently called Dominique; that it was from thence transported to Europe, as stated by Brassavolus, where it was first communicated to the Spaniards, from them to the Neapolitans, from both of them to the French, and from all these to other nations. William Becket, a surgeon in London, affirmed that the disease was previously known in Europe; and published two papers in the "Philosophical Transactions," vols. xxx. and xxxi (the first in 1718), to prove that it was known in England long before 1494, and that it was called Brenning. But Astruc meets and explains every argument of Becket's; and Dr. Freind, in his "History of Medicine," confirms the opinion of Astruc, that it was brought from the West Indies. "One thing," says he, "is remarkable; the Spaniards upon their first expedition to America brought home from thence this contagious disorder, and soon after carried another of equal infection thither, the small-pox, of which the Indian prince Montezuma died." He moreover states, "it often went by the name of Patursa, the very expression which was in use amongst the Indians." Physicians, astonished at the novelty of the disease, and finding that the medicines which were usually given in leprosy (a disease in some respects resembling this), proved ineffectual, were at a loss how to treat it, and in despair, left it for a time in the hands of quacks and mountebanks. But Gonsalvo Ferrand, who was himself affected at Naples, and knowing no cure, went off to the West Indies to find out how the natives treated it. He soon discovered that guaiacum was chiefly relied on—an instance of a country producing both disease and antidote—and returned to Spain, where he made a large fortune by the use of it.* Velasius informs us that Charles V. was cured of the disease by guaiacum; and its virtues were also extolled in a poem by Fracastor; but, in spite of it and other remedies, Francis I. of France is said to have died from the effects of the malady.† It may well be imagined, that, on the appearance of so formidable a disease, which menaced the entire destruction of the human race, and subjected physicians to the greatest ignominy, for their ignorance of its nature, as well as of the remedies for its cure, every practitioner treated it according to his own peculiar fancy, just as we have seen the Asiatic cholera treated in our own day. Many employed sassafras, another American antidote, which was introduced by Nicholas Monardes; whilst others depended on opiates. Later still, sarsaparilla, another native of the New World, was introduced as a medicine of great efficacy; but experience did not verify the encomiums which were bestowed on any of these. In some parts of Spain, where the fluxing of metals was practised, it was observed, that the workmen who were engaged in the operation, if attacked with the disease, regained their health without taking any medicine at all; and thus it occurred, that mercury was, by chance, discovered to be a specific; but for which, the disease might have been still unconquerable. Mercury was used externally as early as 1497; but Paracelsus first gave it internally, and upbraided physicians for depending on guaiacum and China root; he also was the first to show that syphilis modified most other affections by its presence; and so common was it towards the end of the sixteenth century, that all diseases assumed, more, or less, a syphiloid character. It may be quoted, however, as a notable example of the benefit which the study of medicine has conferred on mankind; for just in proportion as the knowledge of its effects on the organic tissues, and of the therapeutical action of the remedies employed against it have increased, the affection itself has diminished both in intensity and complexity. And here it may be observed, that the medical history of the fifteenth century would be incomplete without some allusion to the alchemists, who bequeathed to us a few metallic and mineral preparations for the cure of disease.

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* Fernel relates that it first appeared in the French army at Naples, in 1493: "Unde à Gallis Neapolitanus, à Neapolitanis Gallicus Morbus est appellatus."—*Johannis Fernel's Universa Medicina; de Lue Venereâ*, p. 582.

† Astruc, De Morbis Venereis, translated by William Barrowby. Lond. 1737.

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* Freind's History of Medicine.

† In this poem, or "Tractatus de Syphilide," which he dedicated to the Cardinal Bembo, Fracastor gives an account of the secondary symptoms, and of the advantages of mercurial inunction and salivation. Fracastor obtained his reputation by the "Syphilis," on which Mr. Hallam remarks: "As he thought fit to make choice of the subject, there is no reader but must admire the beauty and variety of his digressions, the vigour and nobleness of his style. Once only has it been the praise of genius to have delivered the rules of practical art in all the graces of the most delicious poetry, without inflation, without obscurity, without affectation, and generally, perhaps, with the precision of truth." Fracastor seems to have made Manilius his model in the didactic portion of his poem.

In addition to the ordinary impulse which springs from the avarice of the human heart, every tale of wonder was raked up in France for the amusement of the perturbed mind of Charles VI.; and, as the manipulations of alchemists promised more marvellous results than any other occupation, the number of adepts greatly increased.

Another inducement originated in a book written by Nicholas Flamel, a native of Pontoise, wherein he affirmed that he had converted a quantity of mercury into silver and gold. The impossibility of the thing is so universally recognised, that if a man were to make a similar boast now, we should know what to think. Alchemists, however, appealed to the sudden affluence of Flamel to substantiate their art; whilst others, less fanatical, have hinted that the book was an invention to divert the king.*

Contemporaneously with several adepts of minor note†, Basil Valentine is supposed to have lived in the early part of the fifteenth century. According to Gudenus‡, he was a Benedictine monk at Erfurth in Prussia. We have already spoken of him incidentally as the discoverer of several salts of antimony which are now used in medicine, and as having been the first to describe sulphuric and hydrochloric acids. His works, according to Hoefer were very popular during the seventeenth century, especially his "Revelation of Secret Artifices" (Offenbahrung der verborgenen Handgriffe); but they are seldom heard of now. His discoveries, however, entitle him to a place in history, although he was deeply imbued with the errors of alchemy.

Motschmann, in his "Erfordia Litterata," has suggested that Valentine was not his real name, because it does not appear in the provincial list of the Benedictines at Erfurth, nor in the general list of that order in the archives at Rome.

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* Histoire de la Chimie, par le Dr. Ferd. Hoefer, tom. i. p. 435. Paris, 1842.

† Jacques Cœur in France, Count Bernard of Padua, Marcellus Ficinus of Florence, Aurach of Strasburg, Thomas Norton of England, Tritheim of Austria, Isaac of Holland, and many others.

‡ "Eadem ætate (scilicet anno 1413) Basilius Valentinus in divi Petri monasterio vixit, arte medica et naturali indagatione admirabilis." — *Joan Maurit. Gudenus in Historia Erfordiensi.* Erfurti, 1675.

The frequent recurrence of epidemic diseases during the fifteenth century is noticed by Short, Pistorius, Hecker, Fernelius, Webster, and others. These pestilential visitations were, doubtless, occasioned by the filth, in which the most affluent of people lived, and by which they were surrounded at that time. Moreover, we have the direct testimony of Guy de Chauliac to that effect; for he noticed that the plague was remarkably fatal to the Carmelite monks at Avignon, who were notoriously dirty and indolent; and, as a further illustration, it may be affirmed, that, with the improvements in the social habits of the inhabitants of Europe, many of these diseases have died out. The plague, the sweating sickness, and leprosy, are now known to us only as historical facts, whilst dysentery, fever, and other zymotic diseases, still cling to us with more or less intensity, according to our neglect or observance of hygienic laws.

That practical experience which might have been applied to the protection of the public health, was never thought of, or so vaguely turned to account, that, as no great mystery was disclosed by it, so no manifest result ensued. And this naturally leads to the consideration of the state of the profession at that period.

In Italy, Hippocrates and Galen were reverenced as the models of physicians, whilst Albucasis was the ideal standard of the surgeons.* The Italian universities conferred degrees on physicians and surgeons alike; and, although no great advance in medicine or surgery was made by either, yet the practitioners of each department maintained a spirit of good fellow-ship, and evinced a certain amount of diligence in their respective pursuits, notwithstanding that they were mere followers and commentators of ancient authorities. From Italy, the taste for Greek literature extended itself into Germany, where an unrestrained expression of thought and a free press were accorded by Maximilian, who thus became the instrument by which rays of light were projected on a path over which Luther was destined to travel.*

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* Girodat, p. 32.

But in no part of Europe was the administration of hospitals rescued from the hands of the clergy. Even on the battle-field priests were esteemed above surgeons, if we may depend on Moehsen†, who states that by order of the first Council of Ratisbon every commander should have two bishops with priests and chaplains; and every colonel should be attended with a confessor.

No mention is made of field hospitals or army surgeons in the middle ages until about the fifteenth century, when field surgeons were appointed for the use of the commanders and principal officers, but not for the service of the field hospital. That was superintended by priests.‡

In France, in consequence of the compromise between the dignitaries of the Church and their subordinate clergy, whereby the practice of surgery fell into the hands of barbers, the relative position of physicians was improved. Being admitted as members of the University, they were so inflated with their titles, that they considered their dignity compromised, not only by the practice of surgery, but even by visiting a patient in bed.*

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* Sprengel, vol. iii. p. 4.

† Geschichte der Wissenschaften.

‡ When Henry V. of England carried on war in France in 1415, he took with him Nicholas Colnet as field surgeon for a year, for which he received forty marks or pounds, ten quarterly. See Rymer's Fœdera, tom. iv. cap. ii. pp. 116, 117.

For a long time, according to the register of the University of Paris, their functions were confined to the examination of such evidence, either in the shape of excretions or detailed accounts of cases, as might be sent to them, (a custom which has been admirably illustrated by the exquisite paintings of Jan Steen,) whereupon they decided on the nature of the disease and the appropriate remedies.

The surgeons were not members of the University; but as M. Thou informs us, were regarded rather in the light of students, of which there were two orders, the *Médecins-Chirurgiens*, and *Clercs*†; the former being qualified to be admitted into the Faculty and University, on the condition of renouncing surgery, whilst the latter, not having been educated as ecclesiastics, were denied the privilege of such advancement.

All went on tolerably well, however, until about the middle of the fifteenth century, previous to which the Faculty of Medicine had no fixed habitation. In the vicinity of a holy font, in the church of Notre Dame, the physicians were wont to meet; and thither as many of the sick as were able flocked to them.‡ It was a curious assembly, and one not unlikely to lead to much abuse and corruption, where ecclesiastics ministered to the physical infirmities of their patients and immediately after perhaps, in a confessional close by, absolved them from their spiritual delinquencies.§ Nor were instances wanting, if the scandalous reports were true, in which the sanctity of the church was grievously desecrated by the licentious monks. The Cardinal Etouteville had the sagacity to estimate the demoralizing influence and opportunities which these customs gave to physicians as well as to patients, and obtained from the Pope a revocation of the ordinance which imposed celibacy on the members of the Faculty; so that, in 1452, they were allowed to marry, and made to forsake their cathedral haunts and benefices.* Their emoluments were thus diminished whilst their wants were increased†; whereupon began the jealousies between them and the members of the incorporated College of St. Louis, which continued with more or less intensity, according to the reciprocal acts of hostility which were committed by either party, for more than three centuries. The Faculty, by virtue of its affiliation with the University, assumed a supremacy and claimed privileges which were felt to be offensive as well as oppressive towards the surgeons; whilst these latter, by encroaching on the vocation of the physicians, were looked upon as odious rivals and usurpers.‡

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* Girodat, p. 17.

† Ibid. p. 19.

‡ Ibid. p. 84.

§ Ibid. loc. cit.

The barbers, who were allied with the surgeons, and, in conformity with the ordinance already alluded to, were duly examined, strove to extend the boundary of their licence, and to identify themselves more intimately with their superiors, by whom they were held in rigorous subjection; so much so that the bondage eventually became irksome and intolerable.§ Taking advantage of this feeling the physicians were accused by Pasquier (and he quoted the subjoined decree of the faculty*, dated 1493, as a proof) of having endeavoured to exalt the authority of the barbers to the disadvantage of the surgeons, by appointing a member of the Faculty for the purpose of explaining the treatises of Guy de Chauliac, and other surgical authors, to the former. Professing an earnest zeal for the improvement of the profession and the public weal, they made the ignorance of the barbers a pretext for educating them; whilst, in fact, they made them more formidable rivals to the regular surgeons.†

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* Girodat, p. 86. † Ibid. p. 87. ‡ Ibid. p. 87.

§ Girodat, p. 92. The surgeons claimed the right of examining candidates for membership by virtue of a charter conceded to them by Philippe-le-Bel in 1311. They were embodied in the college, which was called the "College de Saint Côme." The privileges accorded to the surgeons by this charter appear to have been the

The barbers being thus adopted by the Faculty in defiance of the College de Saint Côme, the surgeons made a special appeal to the University for confirmation of the privileges accorded to them by the charter of Philippe-le-Bel; but the Dean of the Faculty (Hélin), a professed enemy of the surgeons, declared that those privileges had lapsed.

The surgeons reciprocated by speaking and writing invectives against the faculty, an instance of which has been transmitted to us by Lanfranc. "O Deus," says he, "quare sit hodie tanta differentia inter physicum et chirurgum, nisi quoniam physici manualem operationem laicis reliquerunt, aut quoniam, ut dicunt, quidam operari manibus dedignantur, aut, quod magis

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cause of the jealousy and discord between the physicians and surgeons. See also Pasquier, Recherches sur la France, liv. ix. ch. xxxi. p. 869. Fol. Paris, 1620.

[*] "Placuit Facultati quod Barbitonsores haberent unum de Magistris Facultatis qui leget iis Guidonem et alios ductores verbis latinis, eis exponendo aliquando verbis familiaribus et gallicis secundum suam voluntatem."

[†] Girodat, p. 102.

credo, quoniam operationis modum necessarium non noverunt?"

The barbers, in consequence of the assistance which they received from the Faculty, became a third party to the feud*; and, although at first they adopted the quarrel of the physicians, as a requital for past services, they soon discovered interests of their own, which were more or less antagonistic to those of the other two bodies, in proportion to the extent to which their vocations led them to trench on the province of either the one or the other. Each party thus came to view its rivals with a jealous eye; and, as time wore on, inherited the rancorous and vindictive feelings of its predecessors, notwithstanding the various attempts to effect compromises and reconciliations, and in spite of the direct intervention of papal and royal ordinances, which are recorded in the work of Girodat. In England likewise dissensions arose between the different faculties.

Eventually, in 1515, shortly after the death of Hélin, another appeal was made to the University by the College of Surgeons, which resulted in a decree that a distinction should be made between surgeons and barbers, and that the Surgeons should be members of the Faculty with permission to grant diplomas of licentiates, and doctors in surgery, which had greater attractions for the members than the more peaceful occupation of enlarging the boundaries of knowledge.† The graduates in medicine and civil law, whose respective stations in the universities had never been positively determined, embarked in a vehement controversy on that subject.* As the supreme dignity was vested in the Church, and the graduates in divinity enjoyed an undoubted superiority over those in other faculties, the clergy rested satisfied with their own power, and took little trouble to ascertain the precedence of others. But the dispute was carried on with great acrimony by the faculties of Civil Law and Medicine, and eventually terminated in the victory of the latter; a decree being issued which assigned to the graduates in medicine seats in convocation on the right side of the chancellor, and to the civilians, seats on the left.†

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* Girodat, p. 110.

† Life of Thomas Linacre, by John Noble Johnson, p. 87.

But pure physicians were then very rare; for medicine was made an accomplishment of the priesthood; and to that circumstance, perhaps, was the honour which has been just alluded to attributable.. The decision, moreover, was made in the time of Henry VI., who gave great patronage to physicians, and deputed three, in conjunction with two surgeons, to regulate his food and administer his medicine, of which he appears to have taken a prodigious quantity.*

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* A curious and interesting pamphlet was written on this subject by Swift, entitled, "The Right of Precedence between Physicians and Civilians inquired into," wherein he decided the point as follows: "The nicest logicians will allow it a fair way of arguing in all cases, to refer to things what is true as to persons; and therefore I conclude if physick be a faculty more ancient than that of civil law, then it literally goes before it (i. e.), takes place of it; and I hope it will not be denied that physick is as old as the occasion of it, as old, indeed, within a few days as mankind, which can by no means be said of the other (in comparison) upstart profession, unless any one will be so hardy to affirm there was a Doctors' Commons or Bishops' Court in Paradise."

† Johnson's Life of Linacre, p. 87. Swift, in the pamphlet previously alluded to, proposes the following rule to be observed by all professors in each faculty, and their understrappers: "That a doctor of physick shall take place of a doctor of laws, a surgeon of an advocate, an apothecary of a proctor of office, and a tooth-drawer of a registrar in the court."

The earliest mandate or warrant for the attendance of a physician at court that has come to our knowledge is dated 33 Henry VI.; when the person whose services were required was summoned by an order, issued either by the king himself under his sign manual and privy seal, or under those of his minister, and discharged at the termination of the disease with such remuneration as the length of his attendance, his skill, or the munificence of his sovereign might award.

In more than one document of this kind, a distinction is made between the rank and office of the Physician and those of the Apothecary; the services of the former are stated to have been paid "*in reward*," a term expressive of an honorarium, or gift, and not like those of the latter, in the form of a legal demand.†

About the end of the fifteenth century, and the first part of the sixteenth, the honour attached to the title of Doctor was thought, by the Germans, to be greatest when obtained in Germany. A native German, who graduated in a foreign land, was thereby rendered incapable of holding certain appointments, which were much coveted in the imperial court.

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* Johnson's Life of Linacre, p. 165.

† Ibid. p. 165. "In the Cotton Library there is a volume of extracts from an original book of accounts of Henry VIII., with the sign manual at the end of each month, supposed to be the accounts of Sir O. Bridgman, which contains some curious particulars of the state of medicine during that reign." I have made the above statement on the authority of Johnson; but Aikin, in his "Biographical Memoirs of Medicine," asserts that Nicholas de Ferneham was called to Court by Henry III. in the thirteenth century, and John of Gaddesden in the fourteenth. Of Ferneham it is reported that he was entertained as domestic physician, at a large salary, until he was made Bishop of Durham. See Aikin, pp. 4, 5.

According to the etiquette of that court, a very young doctor of divinity or law took precedence of the oldest doctor of medicine; but eventually age regulated the value of the honour.

The diplomas of all three conferred certain privileges. If circumstances ever brought the holders of these diplomas before a judge, they might remain seated whilst sentence was being pronounced. Their wives were authorised to dress as noble ladies did. The old German doctor might wear a sword, a confession of nobility, although not nobly born, which was never made either in France or Italy.

He was moreover exempt from certain taxes; he was never subjected to pay tribute of customs or duty of excise. He was also free from arrest; nor could he be summoned against his will as a witness; but, when he chose to make a deposition, his oath or his word was held to be twice as potential as that of an ordinary man.*

Nicholas Hostresham and John Phreas, two English physicians, are said to have acquired considerable celebrity during the fifteenth century; but as neither of them advanced the knowledge of their profession, the only interest attaching to either consists of an anecdote concerning the latter, who, after being educated at Oxford, and officiating as a minister of the Church, proceeded to Padua to study physic, and afterwards to Rome to practise it.

"He translated Diodorus Siculus, and dedicated it to Pope Paul II., which procured for him from that pontiff the fatal gift of an English bishopric. But he never enjoyed it; for a disappointed candidate for the preferment is said to have poisoned him, before the day appointed for his consecration.*

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* A Book about Doctors, by J. Cordy Jeaffreson.

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* A Book about Doctors, by J. Cordy Jeaffreson.

CHAP. VIII.

THE PRINCIPAL ANATOMISTS OF THE SIXTEENTH CENTURY.

THERE is nothing more difficult than a really just comparison of one age with another, and nothing more natural than a total disregard of the obstructions which formerly lay in the way of scientific advancement. The early ages of Christianity were pre-eminently uncritical, so that the vices of the priesthood, whilst they passed unnoticed, did not excite the indignation of the laity. Civilisation was at a low ebb, therefore the physical attributes of the sexes were chiefly admired and estimated accordingly. Those who *were* learned, occupied themselves more with the grammatical interpretation of the ancient classics [*] than with the moral practices of their nearest neighbours; but as time wore on, the revival of learning brought knowledge and superstition into juxtaposition, and, for a time, they remained so without a conflict; yet, as intellectual culture advanced, and the light of reason exposed the misdeeds of those who should have been examples to others, a good deal of speculative scepticism arose on the one hand, and inveterate prejudice and antagonism on the other: [†] so that, although there had never before been so great a progress in scholarship, there had never before been so great an opposition to it.

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[*] Sprengel, vol. iii. p. 3.

[†] Ibid. vol. iii. p. 4.

Under the auspices of the Medicis, the Estes, the Gonzages, the Sforzas, and the Dukes of Urbino, Italy became the centre of the arts and sciences; and the stream of literature was once more traced back to its fountain-head.* Hippocrates and Aristotle were studied in the original Greek instead of Saracenic and garbled translations. The power of knowledge, which the ancients possessed, was again appreciated, and affected the imagination with wonder and novelty. It was "a voice to the heart of the living from the writings of the dead, as of 'deep calling unto deep,' showing that the actions, the thoughts and teachings of those who have gone before us, may awaken as much ardour and enthusiasm as the impulses of our own age, or the direct investigation of nature."† Progress, however, is a plant of slow growth; for men's minds are not easily diverted from the groove in which they are accustomed to run; and, as Greek grammar was the subject to which every form of literary research was made subsidiary in the fifteenth century, so was the same form of investigation continued in the sixteenth, and to such an extent, that Argentier, in his commentaries, describing a celebrated university of that period, declared that the four faculties made but one, and *that one*, a body of grammarians.‡ Among the earliest as well as most celebrated physicians of the sixteenth century, one who exemplified in his own person the influences which I have just described, was Thomas Linacre, who, after being educated in a monastic school at Canterbury§, proceeded in 1480 to Oxford, where, associated with William Latimer, he applied himself to Latin and Greek. He then accompanied Selling, an ambassador of Henry VII. at the Papal Court, to Italy; and remained at Bologna when that university was in high repute, in consequence of being selected by the few native Greeks, who had anticipated the general return of their countrymen to the soil of their forefathers in the middle of the fifteenth century, for the teaching of their native language.* At Padua, which was also celebrated as a medical school, he took the degree of Doctor in Medicine with more than usual applause†; and, on his return to England, was appointed domestic physician to Henry VII., in 1501.‡ The year before, he proposed, in conjunction with Grocyn and Latimer, to translate the entire works of Aristotle into Latin; and he performed his part of the undertaking; but Grocyn and Latimer failed in theirs.§ He subsequently wrote a Latin version of some portions of Galen, to wit, "De Sanitate Tuendâ," "De Methodo Medendi," "De Temperamentis, et de Inæquali Temperie," "De Naturalibus Facultatibus," and "De Pulsuum Usu." He also translated extracts from Paulus Ægineta, on "Crisis and Critical Days with their Signs."

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* Sprengel, vol. iii. p. 2.

† W. Y. Sellar, "Oxford Essays." 1857.

‡ Argentier. Comment. i. in Galen, art. "Med." p. 7. Venice edition, 1592.

§ Life of Thomas Linacre, by John Noble Johnson, p. 4.

On the death of Henry VII. in 1509, Linacre was appointed physician to Henry VIII.; shortly after which, he is said, by his biographer, to have turned his mind to theology, when the following anecdote is recorded of him. On reading a commentary on the Sermon on the Mount, wherein a system of religious and moral duty is inculcated in opposition to the passions and propensities of human nature, Linacre no sooner perused the command "swear not at all" than he threw away the book, and with an oath vowed that "this was not the Gospel, or that we were not Christians." He contributed more than any other man to the restoration of Greek literature in this country, his translations being, not only faithful transcripts of the original text, but Sprengel accords to them the additional merit of possessing great purity and elegance of style.*

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* Life of Thomas Linacre, p. 104.

† Ibid. p. 144.

‡ Ibid. p. 162.

§ Grosse's Vollständiges Universal Lexicon, art. "Linacer."

In 1518, letters patent were granted by Henry VIII. to John Chamber, Thomas Linacre, Fernandus de Victoria, physicians to the king, together with Nicholas Halsewell, John Francis, Robert Yaxley, and all men of the same faculty in London, to be incorporated as one body and perpetual community or college. To this privilege were added the power of annually electing a president of perpetual succession, and the use of a common seal. They were to hold assemblies, make statutes and ordinances for governing the college, and all who exercised the same faculty in London, and within seven miles thereof; interdicting any to practise, except licensed by the president and college.† Johnson's Life of Linacre contains an exemplification of the above charter of the Royal College of Physicians of London, bearing the date 1658, by Oliver, Lord Protector of the Commonwealth of England, &c.

According to Aikin, it was in consequence of the intimacy of Linacre with Cardinal Wolsey that the above charter was obtained‡; and it is beyond all question that the college was intended, by its founder, to be the pure and undefiled source of professional honours as well as the pride and glory of all its members. The president and fellows had authority to license all practitioners throughout the kingdom, except such as were graduates of Oxford and Cambridge, who by virtue of their degrees were independent of the college, if practising out of London and its precincts. Authority was also conferred on them to examine prescriptions and the drugs in apothecaries' shops; their censure being enforced with the power to inflict fines and imprisonment.*

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* Sprengel, vol. iii. p. 9.

† Johnson's Life of Linacre.

‡ Aikin's Biographical Memoirs of Medicine, art. "Linacre."

This prerogative they exercised with considerable energy, as appears by the earliest annals of the college which we possess; the very first records having been destroyed by fire, Caius (Dr. Kaye) supplied their place as far as he was able†; and in the year 1552, we find the first reference made to examination for the purpose of noting the rejection of two unfortunate candidates, of whom one was the subject of an admonition from the president to the Oxford University, and of a warm discussion, because that university, at a period very soon after, conferred a degree on so ignorant a man.

That all its members were not pure physicians, (as is implied by that term at the present day) is evident by the abstract of the charter contained in Dr. Kaye's manuscript‡; by which it may be, not unreasonably, inferred that the licentiate was analogous to the general practitioner of our day; and, although there is nothing to prove that the fellows themselves did not dispense their medicines, we may, I think, legitimately infer that they did not: for, in 1524, they enacted a statute, forbidding *Licentiates* to make or sell medicine.[*]

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* Aikin's Biographical Memoirs of Medicine, art. "Linacre."

† Annales a Collegio Condito ac Constituto. Jo. Caio Præsidente Authore

‡ "Eodem etiam parliamento concessum est, ut ex hoc collegio medici non solum partem medicinæ, pharmaceuticam et dieteticam, sed etiam cheirurgicam, si velint exerceant."—Vol. i. p. 2.

The erudition of Linacre and his favourite pursuit in science caused him to receive, from his friend Erasmus, the derisory sobriquet of "a philological pedant."[†] He was the first president of the college, and continued to occupy that position until he died, in 1525; but it is impossible to accord to him any greater degree of merit than that of having restored medical literature; for although he lived during the period of the epidemics and controversies which have been recorded, we have no evidence of his having written a line on either the one or the other. We are, however, indebted to him for correct and elegant translations of the ancient medical works which have been enumerated, and to which it is likely he was incited by the peculiar renown which the University of Padua then enjoyed for the cultivation of the Aristotelian philosophy[‡]; but in no place does he show the tendency to atheism which Pomponatius is said to have impressed on that university.[§] His translation of Galen's "De Temperamentis" has been frequently reprinted on the Continent, and was recommended by Melancthon in the schools of Germany.[‖]

He saw with concern the practice of his art monopolised by illiterate monks, and still more exceptionable pretenders; wherefore he inaugurated the course of the college, by instituting examinations for the purpose of testing the ability of those ecclesiastics whose degrees in theology conferred equal privileges in medicine*; and, as a fit termination to his career, he endowed chairs of medicine at Oxford and Cambridge † for the exposition of Hippocrates and Galen.

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[*] Kaye's Manuscript for year 1524.

[†] Erasmus. Laus Stultitiæ, p. 200; see also Herder, p. 186, note.

[‡] Hallam, chap. iv. sec. lxxviii.

[§] Ibid. loc. cit.

[‖] Ibid. chap. v. sec. xxii.

Contemporary with Linacre, and co-operating in Italy to restore the medical literature of Greece from the imperfections of the Saracenic interpretations to its original spirit and literal meaning, Nicholas Leonicenus excelled our own countryman in advancing the practical application of his art and extending its resources to others. If we may credit the *Biographie Universelle*, he embraced the study of medicine, after confining his early researches to Pliny the naturalist, for the purpose of curing himself of epilepsy, to which he had been subject from his infancy.‡ Having succeeded in his efforts at the age of thirty, he continued the observance of a most frugal diet, by which he had effected his purpose, and lived on to the age of ninety-six in vigorous bodily health and mental power. At the age of thirty-four he graduated at Padua, in 1462, and practised his profession upwards of sixty years after.§ In 1492, he published a letter to his friend Politian ||, reproaching Pliny, and all who had followed him, with inaccuracies in compiling from the works of their predecessors and

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* Johnson's Life of Linacre, p. 163; Grosse's Lexicon, loc. cit.

† Aikin, art. "Linacre;" and Sprengel, tom. iii. p. 9.

‡ Biographie Universelle, art. "Leonicenus."

§ Grosse's Vollständiges Universal Lexicon, art. "Leonicenus."

|| De Plinii et Plurium Aliorum Medicorum in Medicina Erroribus. Ferrara, 1492.

neglecting nature; which letter, according to the judgment of Sprengel, is so pure in language and lofty in spirit, that the history of medicine for a thousand years would fail to produce a work worthy to be compared with it.*

It has been remarked by a celebrated modern writer† that, "the spirit of the age is part of its history, which cannot be extracted literally from ancient records, but must be distilled from those arid materials by the chemistry of the writer's own mind." Now, according to such a proposition, it does appear that there was an instinctive feeling in the minds of these men, that nations require the same course of intellectual culture as do individuals, and that a correct language is necessary for the development of a correct science, just as the advance of the latter at the present day is constantly requiring new words to express such improvement. Accordingly we find Linacre, and others in this country, turning to the study of languages (to Latin especially, which was the vernacular of science‡) as the Italians had done before them§; so that Leonicenus started with the conditions necessary to bear the fruit which only the followers of Linacre were enabled to do by the assistance of his philological labours. The task which Leonicenus and Linacre were fulfilling in Italy and England, William Koch ‖ and Schwartzend ¶, who assumed the Hellenic name of Melancthon, achieved in France and Germany; at least it appears so; and, if the above be a substitution of imagination for facts, it is an unquestionable fact that the great advance in philosophy followed the study of the oriental languages.

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* Sprengel, vol. iii. p. 8.

† Dissertations and Discussions, Political, Philosophical, and Historical, by John Stuart Mill, vol. ii. p. 142.

‡ Hallam's Middle Ages, vol. i. sec. iv. p. 258.

§ Ibid. vol. i. sec. cxl. p. 244.

‖ Sprengel, vol. iii. p. 9.

¶ Hallam, vol. i. sec. vii. p. 261. It would be possible to introduce the names of many other men who were zealously engaged in

One of the earliest steps was made in Italy, where, on such an assumption, we should expect it; for, in the first decade of the sixteenth century, we find "the first book upon anatomy, after that of Mundinus, was by Gabriel de Zerbi of Verona, who taught in the University of Padua in 1495. The title is 'Liber Anatomiæ Corporis Humani et singulorum Membrorum illius,' 1503. He follows, in general, the plan of Mundinus, but his language is obscure, as well as full of inconvenient abbreviations; yet the germ of discoveries that have crowned later anatomists with glory is sometimes perceptible in Zerbi: among others, that of the Fallopian tubes." * He also first described the puncta lachrymalia of the eyes †, although Bérenger de Carpi has the credit of having done so; and, like the latter, but evidently misled by his dissections of the lower animals, he described two lachrymal glands, as

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the subversion of the Saracenic rule, by publishing pure and elegant Latin translations of ancient Greek writers, such as Hippocrates, Galen, Dioscorides, and Ætius, to wit, Gregory Valpi in Venice, who published selections from Galen; George Valla of Placenza, the victim of Louis Sforza, who wrote a kind of encyclopædia of the knowledge of the 15th century; Leonard Fuchs, who has been already noticed, and John Hagenbut, who is better known by his Latinised name of Cornarus, both of whom wrote commentaries on the Greek authors above mentioned; whilst in this country Grocyn, Latimer, Fisher, and Colet may be cited, but not as medical authors.

* Hallam, vol. i. sec. xvii. p. 267; Biograph. Univ., art. "Zerbi;" and Portal, vol. i. p. 251.

† Biographie Universelle, art. "Zerbi."

existing in each orbit, instead of one.* The work on which the reputation of Zerbi is chiefly founded, is his "Anatomia Matricis et De Anatomia et Generatione Embryonis," published at Marbourg in 1537.† In the analysis which Portal gives of Zerbi's works, he says: "Notre auteur est un des premiers qui aient décrit la première paire des nerfs olfactifs;" whereas some authors have given Galen the credit of having first noticed them; but, on referring to that author, he certainly does not speak of the nerves themselves as conveying the impressions made by odoriferous particles, but simply of the channel by which the sense is transmitted to the brain.‡

Bérenger de Carpi achieved great honour at Bologna, and was generally regarded as one of the restorers of anatomy and surgery.§ His love of dissection was so great, that he exposed himself to the imputation of having dissected some living Spaniards; for which, it has been said, he was banished to Ferrara. But he himself reviled Herophilus and Erasistratus for the same cruel act; with no better evidence, however, than was offered to prove the crime wherewith he was charged. Sprengel gives him the credit of having simplified and improved the treatment of scalp wounds.||

Achillinus was a contemporary of Bérenger, and a professor in the University of Bologna, where he taught

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[*] Biographie Universelle, loc. cit.

[†] Histoire de l'Anatomie et de la Chirurgie, le Baron Antoine Portal, vol. i. pp. 247–253.

[‡] "Nasi quidem cavitas iter quoddam est, qua itur ad cerebrum ac disceditur: neque alia rectior via aut declivior præter nasi foramina, inveniri potuisset, quæ cerebri purgamenta educeret, et olfactu sensiles odores admitteret."—*Protospatarius*, lib. iv. cap. xi.

[§] Portal, vol. i. p. 272.

[||] Sprengel, vol. iii. p. 399.

philosophy as well as medicine with so much earnest enthusiasm that he was called the second Aristotle. He adopted, however, the opinions of his patronymic with the vigour and perspicacity of the original, enfeebled and perverted by the interpretation of Averrhoës; in other words, he became a follower of the latter author, and, rightly, found a stanch adversary in Peter Pomponaceus*; for, in despite of his devotion to Aristotle, Averrhoës originated a doctrine of his own, and advocated it as Aristotelian†, having deduced it from a bad Arabic version of Aristotle, which he is said to have used.‡ But, notwithstanding his misinterpreted philosophy, many anatomical discoveries are due to Achillinus; and, as it never happened that a man occupied a high and prominent position without becoming the mark for the arrows of the less gifted, so it is probable that his European reputation may have made Pomponaceus a more vehement detractor. He discovered the Whartonian ducts of the submaxillary glands, two of the small bones of the ear—the malleus and incus—and the vermiform appendix to the cœcum. Moreover, the olfactory nerves were first described by him so definitely as to leave no doubt of their identity §: "Nam penetrant ad nares sub caruncülis transeuntes." Of the brain generally he evidently knew more than any of his predecessors.||

Before we proceed farther in the history of our profession, during the sixteenth century, it may not be uninteresting to notice the sudden change which ap-

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* Portal, Hist. de l'Anatomie, vol. i. p. 269.

† Hallam's Literary History, vol. i. sec. lxxxvi. chap. iii.

‡ Ibid. loc. cit.

§ Portal, Hist. de l'Anat. pp. 270, 271.

|| Ibid. loc. cit.

pears to have animated the whole of Western Europe with the spirit of emulation and independent research so entirely at variance with the marked absence of it during the Saracenic rule, that it may be said to have laid dormant from the conquest of Alexandria in the seventh century. At the revival of learning we have seen how purely grammatical and unproductive the scholastic system of education became, useful as such a course of intellectual training may have been. But this form of mental discipline eventually yielded to, and disappeared before, a more discursive literature and polite letters—humanities as they were called—whilst the men who achieved the destruction of the one and the development of the other, were denominated Humanists. We may well be excused if we feel an undue partiality towards a period which so deeply affected our sympathies, as well as the whole course and direction of our subjective existence; nor should we forget that it is to those men who prepared the way for the Reformation that we are chiefly indebted, and to no one individual more so, perhaps, than to Erasmus, the declared enemy of scholasticism, who, with many faults, which it requires no great amount of charity to attribute to his physical infirmities, his want of relations, friends, and even of a country, in a world wherein he stood alone, was a good man. Vanity was the great illusion of his life; but "e'en his failings lean'd to virtue's side;" for in the scholar, he never forgot the Christian. As may be inferred from his biographer*, Erasmus fondly hoped that the progress of polite letters would soften the manners and enlighten the minds of his fellow-creatures, that the superstitions of the middle ages would be exploded by a more liberal education, and a simpler Christianity; that obstinate monkhood would shrink into its proper sphere, and that monasteries would become the retreats for literary leisure. But he was cruelly persecuted by Dominicans and Carmelites, who, from their pulpits, thundered forth denunciations, anathemas, and imprecations against him as an Arian, a heretic, and a scoffer. Erasmus himself was not always superior to the superstition of the age. In his younger days he had attributed his recovery from a dangerous illness to the intercession of St. Genoveva, to whom he addressed an ode. The saint, it is true, was aided by William Cope, the most skilful physician in Paris; but the patient failed to discover any merit in the latter.*

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* Leben des Erasmus, von Rotterdam. Von Adolf Müller. 1828. See also a notice of the same in the Quarterly Review for July, 1859.

Medicine, like other arts and sciences generally, felt the genial influence of the Humanists, who turned the attention of their professional brethren from the commentaries of the Arabs (which were so garbled and falsified that the original text could scarcely be recognised)†, to the writings of Hippocrates himself; so that, by an easy transition, the value of correct observation, and an accurate detail of facts, began to be duly estimated. Linacre, Leonicenus, Zerbi, Bérenger, and Achillinus, were essentially Humanists; but Erasmus was pre-eminently so in his work called the "Ciceronianus;" his object therein being to establish a pure taste, sound judgment, and Christian wisdom, by its wit, sense, and learning.‡ John Gonthier of Andernach, who has been casually noticed as a Revulsionist, may, with more justice and propriety, be classified with the Humanists, seeing that he took a fair share in the improvement of the literature and practice of his profession. Born in 1487, he began life as a poor student at Utrecht, Deventer, and Marbourg*, and subsequently became professor of Greek at Louvain. In 1525, he went to Paris, where he graduated in medicine, was appointed professor of medicine and anatomy in the University of Paris, and Physician to Francis I. His biographer, Herrisant, states that he taught Rondelet and Vesalius: this latter, however, in whom gratitude was not the reigning virtue, always denied it. He paid great attention to myology, and is said to have described several muscles of the hand previously unknown.† After paying great attention to the plague, true to the spirit of his age, like Hippocrates, he advocated the use of fires as the best disinfectants.‡ A further accession to classical literature was effected by him in good translations of Galen, Oribasius, Paulus Ægineta, Alexander Trallianus, and Cœlius Aurelianus; as well as in a detailed epitome of the progress of medicine from the earliest periods down to his own §: a compilation, according to Sprengel, of a work now lost to us by an author named Wimpinæus.||

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* Quarterly Review, No. ccxi. p. 33.

† Sprengel, vol. iii. p. 26.

‡ Hallam's Literary History, vol. i. sec. vi. chap. v.

The task which Gonthier so nobly achieved in Paris was undertaken by William Koch—a graduate of Paris—at Basle; where he translated Galen's works into very pure Latin,¶ Jacques Houlier, also, and Louis

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* Biographie Universelle, art. "Gonthier."

† Ibid. loc. cit. ‡ Ibid.

§ De Medicinâ Veteri et Novâ. Fol. Basil, 1571.

|| Sprengel, vol. iii. p. 10, note. ¶ Ibid. p. 9.

Duret translated and commented on the "Coan Prenotions or Book of Prognostics" by Hippocrates, in so faithful and elegant a style, that the Hippocratic school obtained great popularity throughout France in consequence.*

The humanities in Germany found a most congenial soil, wherein the first germs, nurtured by the superintending care of Hanbut, Fuchs, and Lange, grew and flourished, notwithstanding the impediment which the superstitions of the sixteenth and seventeenth centuries caused; each succeeding generation of true and orthodox men, like the trees of the forest, striking a deeper root and rising more vigorously over the remains of their predecessors.

John Hanbut or Hagenbut, but better known as Cornarus, was the Linacre of Germany, and enjoyed a high reputation, not only among his countrymen, but Erasmus praised his translations of Galen, Dioscorides, and Aëtius.†

John Lange was well nigh as celebrated as the last-named author, for engaging with many lingering fallacies of the Saracens, and setting forth, in lieu of them, the more enlightened doctrines of the ancient Greeks. He showed the fallacy of using the renal secretion as a means of diagnosis instead of the pulse, upon which Hippocrates and Galen depended.‡

Leonhard Fuchs has already been alluded to as the opponent of Driviere in the question of revulsion and derivation; but he directed his most bitter sarcasms against Cornarus, his great rival in supplanting Avicenna, who was still regarded by many as the prince of physicians. His Commentaries on the Aphorisms of Hippocrates were manifestly written for the sole purpose of exalting him and subverting the Arabs.* He also showed the distinction between the leprosy of the Greeks and that of the Arabs †; assigning to each its peculiar characteristics. The breaking up of the Saracenic rule was really as great an innovation in medicine as was the Reformation in religion ; but the most curious circumstance attending it was the fact, that, notwithstanding the common object in which medical reformers were engaged, the renown which each acquired appeared to be a source of disquietude and animosity to others : so that, even with an abundance of materials, and a most fascinating field, wherein each might expatiate to his heart's content, it would seem as if the uncertain nature of the science generally animated almost every individual with a spirit of jealousy, second only to the odium theologicum, which is proverbially intense. In France, the disputes between the Faculty of Medicine and the surgeons still continued. In 1510, Maître Jean Guichard being Dean of the Faculty, a meeting was convened for the better regulation of the surgeons ; when it was ordained that they should attend the lectures of the professors of medicine.‡ The doctors decreed it for the public good, but the surgeons imputed the act to a spirit of domination. There can be little doubt, however, that the physicians were sincere in their desire to advance the interests of the profession, and anxious to protect it against the charlatanism to which it was a prey, and which, according to the representation of Gilles de Soulphuor, the then president of the surgeons, was most practised by the barbers whom the Faculty had taken under their especial protection. Thus amalgamated with the Faculty, and a kind of compromise being effected between the two bodies, whereby the surgeons engaged to abandon the practice of medicine, and the physicians to withdraw their protection from the barbers*, the former applied themselves more earnestly to the improvement of their art†, and one of the first fruits of the amnesty was the recognition of a most important and dangerous operation as not only feasible but hopeful.

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* Haeser's Geschichte der Medicin, p. 381.

† Sprengel, vol. iii. p. 11, note; see also Haeser, p. 381.

‡ Sprengel, vol. iii. p. 16.

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* Commentaria in Hippocr., Septem Aphorismos. Lugd. 1559.

† Sprengel, vol. iii. p. 12. Fuchs was an enlightened disciple of Luther, an earnest Reformer, and a diligent student of natural history. All his works indicate originality of thought and soundness of judgment; but when combating the opinions of his adversaries he was too apt to dip his pen in gall. In botany he showed that many plants mentioned by Theophrastus, Dioscorides, and Hippocrates had been misapprehended, and he was the first to accord the properties and name to the Digitalis purpurea.

‡ Girodat, p. 160.

It has been seen that the Italian surgeons, under the influence of Albucasis, were at a stand-still; and, although Portal speaks of Jean de Vigo as an eminent surgeon of the early period of the sixteenth century, it was more in consequence of his disinterested philanthropy than of any improvement he imparted to his art.‡ Both he and Sylvaticus had allowed many of the chief operations to be practised by itinerant quacks, amongst whom, a family named Norsini, of Milan, were famous for their dexterity in lithotomy. One of them had visited France, and communicated his knowledge to a surgeon named Colot, from whom it was transmitted to others of the same name. The operation had been occasionally done before, but in so bungling a manner, that the axiom of Hippocrates still prevailed relative to the fatal nature of wounds in the bladder. Eventually, however, a case presented itself in an archer afflicted with stone, who had been condemned to death for theft. Germain Colot represented to Louis XI. the importance of testing the operation, for the interest of many similarly afflicted; whereupon the criminal was allowed the benefit of the experiment, and a reprieve from his sentence. Every precaution was taken for the successful issue, and it is recorded that the patient had perfectly recovered on the fifteenth day.* The operation continued to be performed by the Colot family exclusively, and the manner of doing it was kept secret until 1535, when Marianus Sanctus of Barletta published his work entitled, "De Lapide Renum Liber, et Vesicæ Lapide Excidendo," acknowledging himself the pupil of Jean de Romanis.† From Marianus, the method was imparted to Octavien da Villa; and from him to Laurent Colot, who became the most celebrated operator in Europe.‡ In according all due honour to these various surgeons, it should not be forgotten that Celsus described an operation for the removal of stone from the bladder §; but it was rude in character, and restricted in practicability.

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* Girodat, p. 125.

† Ibid. p. 252.

‡ Portal, vol. i. p. 258.

From the beginning of the sixteenth century, however, when Montagnana published his treatise on anatomy ||, both anatomy and surgery were more zealously

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* Girodat, p. 260; and Sprengel, vol. iii. p. 383.

† Portal, vol. i. p. 289.

‡ Sprengel, vol. iii. p. 391.

§ Celsus, lib. vii. cap. xxvi. p. 2.

|| This scarce work, by Montagnana (Petrus de), was first published at Vienna in 1513, with large and elegant woodcut portraits and anatomical figures by Mantegna.

cultivated in Italy, but waned in France, so much so that, whilst Bologna, Padua, and Ferrara were furnishing to Europe the most celebrated men of the age, the best Italian works of the period were but little known, either at Paris or Montpelier.* Francis I. had the sagacity to recognise the deficiency, and founded the Royal College of France, wherein he established the best professors he could obtain†; and, in a short space of time, the medical school of Paris acquired a brilliant reputation by its connexion with such men as Etienne, Sylvius, Fernel, Vesalius, and Ambroise Paré.‡ Vidus Vidius was the first professor of medicine appointed to the college, in consequence of being physician to the king; but he was more celebrated as an anatomist, his descriptions of the brain and eye being far more perfect than those of any of his predecessors. He also first described the little tubercles on the semi-lunar valves of the heart, called corpora Arantii, from Arantius, who lived nearly a hundred years after him, and to whom Morgagni gives the credit of such discovery.§

As some of the above names have been mentioned in conjunction with the controversy in relation to the theory of revulsion and derivation, and as they are likewise connected with the antecedents to the discovery of the circulation of the blood, it may not be uninteresting to group together the harbingers and heralds of that remarkable event, seeing that it may be done without any great violence to a strictly chronological arrangement.

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* Histoire de l'Anatomie et de la Chirurgie. Portal, vol. i. p. 341.

† Ibid. vol. i. p. 342.

‡ It must not be inferred that the men whose names are here mentioned received their education in the Royal College, for they had all established their fame either before or very shortly after that institution was founded.

§ Portal's History, vol. i. p. 596.

Since the time of Galen, the first circumstance worthy of note, was the discovery of the valves in veins, which Marx* would refer back to the time of Erasistratus, but without anything like a satisfactory reason, nor does it appear evident that Dionysius, Aberti, or Theodorus, to whom Haller refers, ever saw the valves in question. Charles Etienne, or Carolus Stephanus as he is more commonly known, who was a decided imitator of Galen, especially in his comments upon the bones, knew more of the ligaments and described them with greater accuracy than any of his predecessors or contemporaries. He also pointed out the three branches of the fifth pair of nerves, and distinguished the eighth pair from the sympathetic nerves, which had never been satisfactorily done before.† Of the brain he knew much less than Achillinus before him, but he showed the existence of the canal of the spinal cord; an incident of great interest, as teaching us how many things were brought to light by the investigations of these old labourers, which have since been recorded as new, with others as manifestly the germs of absolutely new discoveries. But the most interesting circumstance relative to Etienne is the fact of his having, before any other person, observed and described the valves in veins, which he called apophyses venarum. This honour is generally ascribed to Sylvius, although Harvey states that "the celebrated Hieronymus Fabricius of Aquapendente, first gave representations of the valves in the veins."* In Etienne's work, however, first published in 1536, a paragraph occurs in relation to the vena porta†, which leaves no doubt as to the priority, and clearly justifies Cruveilhier, who also claims the honour for Etienne, seeing that the discovery of the valves at the orifice of the vena azygos, by Cananus and Amatus, was made eleven years after. But neither Etienne nor Amatus profited by the discovery; on the contrary, we have a striking proof of the force of prejudice and of the despotism of dogmas, consecrated by ages; and in consequence of such bigotry as well as of the repudiation of valves by Vesalius‡, Fallopius§, Dunus||, and Eustachius¶; the following remarks of Sprengel, and Fabricius himself are intelligible. "Fabriæ d'Acqua Pendente peut, à juste titre, s'en attribuer, trente ans après, tout l'honneur;" whilst Fabricius himself says "Non solum nulla prorsus mentio de ipsis facta sit sed

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* Marx, Diatribe de Structuraa tque Vita Venarum, 8vo. Carlsruhæ, p. 6.

† Portal, vol. i. p. 336.

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* Harvey on the Motion of the Heart and Blood, Sydenham Society's translation, chap. xiii. p. 62.

† De Dissectione Partium Corporis Humani, cum Figuris à Stephano Riverio compositis libri tres. Fol. Parisiis, 1536. Bibliotheca Adriani, p. 176. The oldest edition I have seen was published in 1545, wherein the passage in question occurs at pp. 182, 183, as follows: I may premise, however, that allusion to the venæ cavæ hepaticæ is clearly intended, for after alluding to the remark of Galen, that the vena porta is like a tree with roots and branches, the latter joining again to make the venæ cavæ hepaticæ, he remarks, "Porro autem, ne sanguis qui elaboratur in hepate, interdum regurgitet, facti sunt à naturâ quidam veluti exortus et apophyses membranarum, quæ hujus modi periculo obsint, quemadmodum in corde valvulæ ad spiritus conservationem."

‡ Anatomicarum Gab. Fallopii Observat. Examen, p. 794. 4to. Venet. 1564.

§ Ibid. p. 395.

|| Sprengel, vol. iii. p. 56.

¶ Ibid.

neque aliquis prius hæc viderit, quam anno Domini septuagesimo quarto supra millesimum et quingentesimum, quo à me summâ cum lætitiâ inter dissecandum observata fuêre."* It is a curious circumstance that Etienne should refer to the vena portæ as that in which he found valves, when it is well known to anatomists that the portal system contains no valves; but the context shows clearly that he alluded to the hepatic veins, where they certainly exist, although in an imperfect state, not altogether justifying the comparison of them with those of the heart.

Another candidate for the honour of the discovery was Jacques Dubois, or Jacobus Sylvius, whose avarice and jealousy, together with the contortions of vulgar ambition which he displayed throughout life, evinced the lack of an early education.† Nevertheless, he was a good anatomist, and made two attempts to lecture in Paris, for which he was unqualified, in consequence of not having graduated there. For that reason the Faculty, in the exercise of its despotic right, prohibited him; nor was it until he took his Bachelor's degree, when he was fifty-three years old, that he lectured at the College de Trinquet, to upwards of four hundred pupils, whilst Fernel lectured at the College de Cornouaille to not more than fifteen or twenty. In 1550, when Vidus Vidius vacated the Chair of Medicine and Anatomy at the Royal College, Sylvius succeeded to it, and had Vesalius as a pupil. That Sylvius saw the valves in question is extremely probable by the references which he makes to the jugular, brachial, and crural veins, as well as to the vena azygos. He called them *epiphyses* venarum, and compared them with the membrane of the foramen ovalis, a somewhat unhappy comparison. Haller naturally regarded a man, at once overflowing with self-esteem and intense jealousy, with some degree of suspicion; wherefore he suggests that Sylvius may have heard of the valves from Cannanus*, and with some reason, for Amatus Lusitanus, the friend of Cannanus, fixes the precise date (1547) when the latter demonstrated the valves of the veins to him, and Sylvius did not publish his work until 1555.†

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* Fabricius. Opera Omnia Anatomia, &c. p. 150. Lips. 1687.

† Such was his avarice, that at his death the following epitaph was proposed for him:

"Sylvius hic situs est, gratis qui nil dedit unquam;
Mortuus, et gratis quod legis ista, dolet."
Portal, art. "Sylvius."

The true history of this particular subject will, in all probability, remain sealed up in the dark and narrow tombs of the men who were engaged in it; but the influence which they exerted through their own age upon ours, is so important that their individual researches are full of interest to us. Now, as Etienne saw only the valves of the vena azygos and hepatic vein, Cannanus and Amatus those of the vena azygos, and perhaps also those of the renal and iliac veins‡, whilst Sylvius described those in the veins of the extremities and neck, we may charitably conclude that all were engaged in their own independent investigations, and that all may participate in the merit of the general discovery. But when it becomes a question of absolute priority, it certainly does appear that the honour should be conceded to Etienne, for two editions of his work were published before Cannanus announced his discovery; and Fabricius himself dates his own as in 1574. The claim of one does not materially interfere with that of another; each, therefore, may enjoy his own respective merit, if merit there be, in observing a structure which has the obvious purpose of assisting a centripetal circulation, and yet maintaining a belief in the centrifugal. An exacting judgment might attach more or less reproach to men, according to the extent of their acquaintance with the valves, which permit the blood to flow in one direction and oppose its course in the other, who were incapable of interpreting the intention of the mechanism.

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* Haller (Elementa Physiologiæ). Neapolitan edition, 4to. 1777, vol. i. p. 92. His precise words are: "Verum is Vir Cl. potuit, quando hæc scripsit, de Joanne Baptista Cannano inaudivisse.".

† (Sylvius.) Isagogue in libras Hippocratis et Galeni anatomicos. Paris, 8vo. 1555. See Haeser, p. 394.

‡ Haller, vol. i. p. 92.

Vesalius, of whom we have already spoken, acquired celebrity at a very early age, to the great discomfort of his preceptor, Sylvius. In 1539 he published his anatomical plates, and had the courage to point out several errors into which Galen had fallen — the most important being the description of openings between the two ventricles of the heart. The existence of such openings Vesalius denied; and, by so doing, cleared away another obstacle to the discovery of Harvey.* In his time, however, the activity of genius was cruelly repressed by Spanish intolerance and Inquisitorial persecution.

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* Haller, vol. i. p. 234. His great work, "De Humani Corporis Fabrica," wherein he denied the existence of holes in the septum, was published at Basle, in 1543, with plates, which were attributed to the pencil of Titian. Another edition of this magnificent work was published under the superintendence of Boerhave and Albinus in 1725, entitled "Opera omnia Anatomica et Chirurgica," to which I shall have to refer.

Hence Sylvius, confident in the public sympathy, and presuming on the clamour of superstition, which then awaited any one who was bold enough to make an attack on the theories of the Galenic school, joined with Riolan, who was full of learning, in denouncing Vesalius as a plagiarist; whilst Puteus, prompted, as Haller supposes, by Fossanus, physician to the king of Spain, wrote a book to impugn the discoveries which were so much at variance with general opinion, and lamented the freedom of the press by which such works were permitted to see the light. Eustachius at Rome, and Driander at Marbourg, joined in the attack, whilst Fabricius alone, of all the great anatomists, maintained a respectful silence.* But Vesalius had not the moral courage to be consistent with himself; for, after denying the existence of the holes between the ventricles, he says of the blood which flows from the vena cava into the right auricle and ventricle, "the greater part is distilled through the pores of the septum into the left ventricle" (admitting, however, that he says this to accommodate himself with the dogmas of Galen), "but the remaining portion of the blood, whilst the heart is contracted and closed, is sent by the artery into the lung."† His correct view of the heart's structure, and desire to harmonise with Galen, involved him in the dilemma of admitting the theory which pre-supposed the fact of the holes, whilst he denied the existence of the holes which were necessary for the maintenance of the theory.

It has been seen how Vesalius repudiated the existence of valves; but whether he was disposed to sacrifice truth to personal prejudice it is now impossible to say—such feelings, unfortunately, having sometimes biassed the assertions, if not the opinions, of scientific men.* His pupil, Fallopius, the Æsculapius of his age, after lecturing on anatomy in the University of Pisa, was called to Padua in 1551, to succeed Vasalius, who went on a pilgrimage to Jerusalem.† Like his teacher, he denied the existence of valves at the extremity of the vena azygos; and, not content with the bare denial, derided Amatus, who stated that Cannanus had shown them to him.‡ He evidently made many experiments to ascertain the course of the blood through the vessels; for he knew that an artery ceased to beat immediately beyond the place where a ligature had been applied to it§; but his respect for Vesalius had a greater influence on his judgment than

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* Portal, vol. i. p. 396.

† "Maximam portionem per ventriculorum cordis septi poros in sinistrum ventriculum desudare sinit."—*Andreæ Vesalii, Opera Omnia Anatomica*, &c. Edit. d'Albinus, 1725, tom. i. p. 517.

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[*] A remarkable instance of the above is related of Arago, whose national prejudice ran so high, that he denied to our countryman, Adams, the honour of having discovered the planet Neptune, and attributed the discovery to Leverrier; but, having afterwards quarrelled with Leverrier, he made every effort to persuade the public that Neptune did not exist at all.

[†] A curious anecdote is related of Vesalius in connexion with this pilgrimage. A Spanish gentleman, who had been under his care, dying, Vesalius requested permission of the relatives to examine the dead body. On opening the chest the heart was seen to pulsate, and when the circumstance was communicated to the survivors, they accused him of murder before the Inquisition. This tribunal was about to inflict its punishment, when Philip II. King of Spain protected him against his accusers, and sent him on his pilgrimage. On his way back he received a summons from Padua to succeed Fallopius, who died at the age of forty; but on his way to resume his former chair, he was wrecked on the island of Zante, where, reduced to the last extremity, he died of hunger, Oct. 15th, 1564, at the age of fifty.

[‡] Portal, vol. i. p. 585.

[§] Ibid

the friendship which he entertained towards Columbus, Cannanus, and many other celebrated contemporaries, to whom the valves in veins were familiar.

Truth, however, is omnipotent, and as omnipresent in the universe as the great God of truth himself. The observations of Etienne, Amatus, and Fabricius were eventually admitted to be correct, and the error which Galen originated, relative to the communication between the two ventricles, was dispelled by Vesalius, who, after expiating the many jokes he is said to have made on the ignorance and vice of the Spanish monks, died, like Socrates, a victim of the warfare which the apostles of error have at all times waged against the investigators of nature and truth. But, when all men yielded assent to his views and were convinced that no openings existed between the ventricles, it was naturally asked, "If the venous and arterial bloods do not intermix in the heart, where *do* they?" for it was too much to expect an abrupt recantation of faith in the Galenic theory, which required for its confirmation the fact of holes, although the holes were shown to be a myth; and men still believed in the necessity of an infusion, into the venous blood, of the essence or spirit, of which, according to Galen, the left ventricle was the fountain head. This last vestige of absolute error was seized on by an acute and restless theologian, who answered the question by propounding the doctrine of the pulmonary circulation.

Michael Servetus (whose family name was Revès) was born at Villanueva, in Aragon, in the year 1509. He was the son of a notary, who sent him while young to the University of Toulouse, in order to study the law, instead of which, however, he devoted his attention principally to theology[*], wherein he imbibed heretical and antitrinitarian notions, which ended in his ruin. In 1534, he proceeded to Paris for the purpose of studying medicine, and, two years after, he published a work on the nature of syrups, which he made the vehicle for a treatise on digestion.[†] The sceptical opinions which he there professed, the reason which he assigned for his belief in astrology, but above all, his ungovernable temper, excited the ire and persecution of the faculty, on which account he retired to Charlieu near Lyons, and subsequently to Vienne in Dauphiné, to practise. He there published an abstruse metaphysical book[‡], of which three copies only now exist; one of the three is in the Bibliothèque Impériale at Paris.

In this remarkable book the first account of a pulmonary circulation is contained. The communication, said Servetus, (meaning the passage of the blood from the right ventricle into the left) is not effected through the septum which divides the two; but by a long and marvellous course, the blood is conveyed through the lungs, where it is agitated, prepared, changed in colour, and passes *from the arterial-vein into the venous-artery* (et a venâ arteriosâ in arteriam venosam transfunditur.)[§] Both Galen and Vesalius knew that *some* blood passed from the right ventricle to the lungs; but that was only half the truth; the whole of it was enunciated by Servetus in describing the passage of *all* the blood from the right ventricle into the pulmonary artery (vena arteriosa) to the lungs, where it is elaborated, changed in colour, transmitted into the pulmonary veins (arteriæ venosæ) and thereby conducted to the left side of the heart.

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[*] Penny Cyclopædia, art. "Servetus."

[†] Sprengel, vol. iii. pp. 32–34.

[‡] Christianismi Restitutio. Vienn~~e~~æ Allobrogum, 1553.

[§] Flourens' Hist. de la Circulation, p. 12.

The idea was novel as it was true, and he illustrated the correctness by showing that the pulmonary vein is larger than is necessary for the mere nutrition of the lungs, and that, in the child before birth, the blood is not all sent by the pulmonary artery, notwithstanding that the same necessity exists for the nourishment of the lungs.

But it is pretty evident, that Servetus had no idea of the importance of his discovery, nor a very accurate notion of it himself; for as an amusing writer has stated, "He speaks confidently of the nerves being continuations of the arteries, and describes with grave precision how the air passes from the nose into the ventricles of the brain, and how the Devil takes the same route to lay siege to the soul. Servetus made one lucky guess among his numerous guesses, by no means of the lucky kind. He announced the fact of the pulmonary circulation, and may receive from history the whole credit of such priority; he also guessed rightly that, in the lungs, and not in the liver, the blood received its elaboration, passing from venous into arterial. But whatever merit may be assigned to Servetus, no influence can be attributed to his discovery; since both he and his treatise were condemned to be burnt by Calvin, and no one heard, for some years at least, of the pulmonary circulation."*

The "Christianismi Restitutio" contained matter which Calvin denounced to the Cardinal Tournon as heretical; whereupon the cardinal is said to have laughed heartily at one heretic accusing another. But Calvin appears to have been actuated by private hatred quite as much as by religious zeal or fanaticism, in consequence of a letter which he received from Servetus, containing what were called the errors and absurdities of Calvin's institutes. This was in reply to a violent letter sent by Calvin to him, concerning his own opinions; and in the same year (1546), Calvin wrote to Farel and Viret, saying that if ever Servetus came to Geneva he would take care that he should not escape in safety*, and he kept his word; for Servetus, after escaping from confinement in Vienne, fled to Geneva, where he was arrested. The copy of his book, already alluded to, belonged to Colladon, one of the public accusers, and contains passages underlined, which formed the basis of Calvin's charge. As a terrible proof of the authenticity of the copy, it is partially burnt by the flames in which both the author and it were condemned to be destroyed together. The book, however, was rescued; and a curious specimen it is of the working of the author's brain on the revealed declaration of God, "Anima est in sanguine; anima ipsa est sanguis." Inasmuch as the soul is in the blood, said Servetus, to know how the soul is formed, it is necessary to know how the blood is formed; to know how the blood is formed it is necessary to see how it moves; and thus it was he was led from the soul to the blood, and from the blood to its course through the lungs. He subsequently enters into an elaborate philosophical course of reasoning half theological half physiological, to explain the nature and properties of the vital and animal spirits, which is more curious than pertinent to the records of medicine; but they who are inquisitive on the subject will find the physiological part of the work in question in Flourens' "History of the Discovery of the Circulation of the Blood."*

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* Blackwood. Edinburgh Magazine, August 1858, p. 151.

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* Penny Cyclopædia, art. "Servetus."

It often happens that important discoveries in science are simultaneously made by two or three individuals, who may not have been aware of the researches of their fellow-labourers; and it may be assumed with tolerable certainty that the antecedents are general which lead to the occurrence. For example, the simultaneous, but independent, discovery of a method of mathematical investigation (the method of Fluxions) in every respect similar to that of Newton, by Leibnitz, created a degree of national jealousy†; but both were prompted to their investigations by the Copernican doctrine, which places the sun in the centre of our system. The application of natural science to practical purposes affords many remarkable illustrations of the same fact: the invention of the steam engine, to wit, has been keenly contested by different nations, and by various individuals of the same nation‡; but all in their researches have proceeded on the known power of the expansion of water when converted into steam, and of the condensation of steam when reconverted into water. Perhaps there is no case in point more illustrative than the concurrent application of chemical agents, by Daguerre and Talbot, to fix the image of an object in the camera: the different means employed, showing pretty conclusively that each pursued his inquiries in perfect disconnection, although both received the stimulus and opportunity from the resources which chemistry presented to them. In public events the same is observed; as, for instance, in the case of the Reformation, which broke out about the same time in Germany, France, and Switzerland, by the independent exertions of Luther, Farel, and Zwinglius, probably before either one of them knew anything of the proceedings of the other two. Enlightened, however, by the doctrines of Wickliffe, men had begun to read the Bible for themselves, and were disgusted with the hypocrisy and scandalous lives of many of the priesthood. So also the great movement in anatomy was affected by the concurrent researches of many individuals, who presumed to think for themselves, and were equally disgusted with the superstition and quackery of many of their contemporaries.

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* Flourens' Hist. pp. 203–214. I have had an opportunity of examining the copy contained in the "Bibliothèque Impériale." Curiously enough, that part only relating to the Trinity (de Trinitate) is burnt; the margins only of the leaves from the 3rd to the 76th page, and slightly in the centres of the leaves from the 141st to the 152nd page. The chapter, "De Regeneratione," is the part containing the underlined passages. At the beginning is a MS. note by Dr. Mead, on whose authority the book belonged to D. Colladon.

† Sir John F. W. Herschel's Discourse on Natural Philosophy, p. 273.

‡ Lardner on the Steam Engine, p. 28.

Realtus Columbus, a celebrated Italian physician, who was a pupil of Vesalius, and subsequently professor of anatomy at Padua and Rome, again propounded the doctrine of the pulmonary circulation six years after it had been first enunciated by Servetus. His work, entitled "De re Anatomicâ," was published in 1572*, wherein the blood-vessels are described very much as Vesalius and Fernel had described them before him. The most curious, as well as most interesting part of his researches, relates to the heart and pulmonary vessels; whereupon, he observes, "between the two ventricles is the septum, through which it is thought that the blood of the right ventricle passes into the left; but it is not so, for the blood is carried by the arterial vein into the lungs, whence it passes, *with the air*, by the venous artery into the left ventricle of the heart; which no one hitherto has noticed or recorded, although it is proper that this should be noticed by all (quod nemo hactenus aut animadvertit, aut scriptum reliquit, licet maxime sit ab omnibus animadvertendum.)"[*] That the discovery was imminent on all sides, is seen in the fact of its being also made by Andreas Cæsalpinus, the great botanist, who does not seem to have been aware of what Columbus had written, since he makes no mention of him; and, as M. Flourens observes, *le grand mérite est toujours probe.* Cæsalpinus, moreover, was the first to pronounce the phrase "circulation of the blood."[†]

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* Columbus (Realtus). De re Anatomicâ, lib. xv. 12mo. Paris, 1572.

He distinctly stated that each ventricle of the heart had two vessels, one for the entrance, the other for the outflowing of the blood.* Hitherto, however, not a syllable had ever been uttered concerning a general circulation; but Cæsalpinus pointed out the inconsistence of the fact of the veins swelling before a ligature with the notion of the blood flowing in them from the heart to the extremities†, and, in a fit of inspiration, virtually saw, in his mind's eye, the general circulation; for, in another place‡, he says, "In animalibus videmus alimentum per venas duci ad cor tanquam ad officinam caloris insiti, et, adeptâ inibi ultimâ perfectione, *per arterias in universum corpus distribui*," &c. Cæsalpinus was a professor in the University of Pisa.

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[*] Columbus, p. 325; see also Flourens', Hist. &c. pp. 17, 18.

[†] Edinburgh Magazine, vol. lxxxiv. p. 151. The precise words of Cæsalpinus are as follows: "Huic *sanguinis circulationi* ex dextro cordis ventriculo per pulmones in sinistrum ejusdem ventriculum optimè respondent ea quæ ex dissectione apparent. Nam duo sunt vasa in dextrum ventriculum desinentia, duo etiam in sinistrum. Duorum autem unum intromittet tantum, alterum educit, membranis eo ingenio constitutis. Vas igitur intromittens vena est magna quidem in dextro, quæ cava appellatur; parva autem in sinistro ex pulmone introducens...... Vas autem educens arteria est magna quidem in sinistro, quæ aorta appellatur, parva autem in dextro, ad pulmones derivans."—*Andreæ Cæsalpini Quæstionum peripateticarum*, lib. v. p. 125. Venise, 1593.

Columbus was followed by Rota of Bologna, who gave in Latin hexameters an exposition of the body, evidently copied from the description which Columbus had written of the heart and its vessels; so that no originality is due to him; and as to the versification of such details, there are but few old books, even on so uninviting a subject as anatomy, altogether free from such fancies.

The culpable partiality with which history is sometimes written, is painfully exhibited in Portal's account of Le Vasseur§, from which it is impossible not to infer that another great step was made towards the discovery of the general circulation of the blood, and that Le Vasseur was the author of it. The narrative in question is so remarkable that it cannot be passed over in perfect silence; and when it is explained that, although it is so *made up* as to lead to the inference I have stated, Le Vasseur himself distinctly affirmed that air, *not blood*, was transmitted from the left ventricle into the aorta, the passage loses all claim to consideration as an advancement in the knowledge of that period.*

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* Andreæ Cæsalpini. Quæstionum peripateticarum, lib. v. p. 125. Venise, 1593.

† Ibid. Quæstionum medicarum, lib. ii. p. 234.

‡ Ibid. De Plantis. Florence, 1583, lib. i. cap. ii. p. 3.

§ Portal's History, vol. i. pp. 373, 374.

Now, if the compiler of the quotation which is given below, had pursued this investigation only for his own satisfaction, it would be of little importance what standard of truth he used; but when his observations are intended to remain as records to posterity, it is of the highest consequence that they should be based on the severest, and totally irrespective of national feeling. But I shall presently have to speak of an individual who has far greater pretensions to share the honour which is now universally accorded to Harvey alone.

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* The following is Portal's ingeniously arranged quotation: "Dextrum, ventriculum, qui sanguineus adpellatur, vena cava *ingreditur*, et vena arteriosa *egreditur*, quæ in pulmonem dispergitur, sanguinem elaboratum conferens....... Sinistro cordis qui caloris nativi fons est, et spirituosus appellatur, arteria venosa *quæ ex pulmone*....... Inde prodit magna arteria, omnium aliorum origo, &c. ...... In dextro totidem sunt (foramina); alterum majus, ex vena cava sanguinem in ipsum cor intromittens; alterum minus, ex vena arteriosâ sanguinem ex ipso corde in pulmonem deducens. His foraminibus....... Ex utroque latere ...... adsunt membranæ.......Ex his membranis quæ intus foras feruntur paratæ ob id sunt ne materiæ remigrarent: quæ verò foris intrò, quæ majores et fortiores sunt, non ob id modò, sed ut etiam attrahendi essent instrumenta. Tensæ enim à corde per eas vasorum tunicæ expeditius contrahuntur, impelluntque facilius, trahente corde, ipsas materias: ipsius porrò rursùs tensio in diastole, membranas intus foras spectantes, radicibus trahens atque ad ipsum cor intro reflectens, omnesque rectas constituens vasorum materias intromittentium, scilicet venæ cavæ et arteriæ venosæ, clauditans educentium."—Vol. i. p. 374.

No sooner was the doctrine of the pulmonary circulation admitted than another fact was brought to light, which, as it bore on the general proposition of the function of respiration, was an important element in the history of the discovery of the circulation of the blood. Leonard Botal, a native of Piedmont, although but an indifferent anatomist, had the felicity to give his name to the opening which exists, *during fœtal life*, between the two auricles of the heart (the foramen ovale), whereby most of the blood is allowed to pass direct from the right into the left auricle, instead of going the round of the pulmonary vessels — an obviously useless course before the important act of respiration begins. He did not discover the opening, for Galen was perfectly familiar with it*, and knew that it was closed up by a layer of membrane immediately after birth, leaving a depression in the septum between the two auricles which we call the fossa ovalis. Carcanus, however, first called it the foramen of Botal, and the name has been accepted by Morgagni, Senac, and Haller.

This same Carcanus, a celebrated physician of Milan, and pupil of Fallopius, demonstrated another peculiarity in the fœtal circulation (which Galen also knew of †), whereby it was made obvious how the whole of the blood admitted into the right auricle of the heart passed into the aorta. A great portion had been shown to flow through the foramen of Botal; but the remaining passing into the pulmonary artery (arteria venosa) and unable to circulate through the condensed structure of the fœtal lung, was traced direct into the aorta by a short vessel (the ductus arteriosus), which exists between the pulmonary artery and aorta.* Like the foramen of Botal it closes immediately after birth, and so compels the whole stream of blood to pass from the right side of the heart through the pulmonary arteries and veins to the left; whilst the duct, being no longer required as such, degenerates into a ligamentous chord.

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* Portal's History, vol. i. pp. 562–564.

† Galen. De Usu Partium, cap. vi. p. 21.

It seems but a tribute of common justice to mention here the name of Cæsar Arantius, the pupil of Columbus, who was forestalled, as we have seen, by Vidus Vidius in the discovery of the corpora arantii, which bear his name. He carefully investigated all the propositions of Columbus concerning the pulmonary circulation, and confirmed them by his own observations; but he did not utter a syllable about a general or systemic circulation.†

This, it has been asserted, was first done by a poor Italian monk, who lived at a time when philosophy in Italy was debased by the inexorable and destructive tyranny of the Spaniards; when every opinion, every discovery, every book, raised the alarm of a new heresy, and had to pass the ordeal of a censorship—trusted to monkish fanatics, who understood them not, and yet dared to report of them as impious and profane; when no one could be a philosopher without being adjudged an atheist or a magician; and when a monk philosopher had more to dread from the suspicions and inquisition of the Court of Rome than any other individual.‡

Fra Paolo Sarpi, whose authority has often been quoted by theologians in their controversies about the Reformation, was born at Venice in 1552. He was educated by Ambrosio Morelli, his mother's brother, a priest who kept a school for grammar and rhetoric. He was a spare and feeble youth, of a serious, pensive, and silent disposition, with an eager thirst for learning, and was remarkable, not only for great penetration but for an extraordinary memory, whereby he acquired an encyclopædic intellect in every branch of study which was then cultivated. In 1565 he assumed the cowl, and became a monk of the Order of Servites, the public reputation of which he greatly enhanced by his achievements in scholastic disputations, for which his convent assigned him an annual sum of money to provide himself with books.* Bossuet affirms that under the habit of a monk Sarpi concealed the heart of a Calvinist†; he was in fact accused of heresy, although on so absurd a pretext that the charge was considered groundless; but he was induced to remove from Milan in consequence, and in 1575 retired to Venice to teach philosophy. In 1578 he received his doctor's degree at Padua, where he formed the friendship of Galileo, and of Pierre Asselinau, a learned French physician and Protestant. He corresponded largely with the most celebrated men of his day, and recorded his observations on Aristotle, his researches in anatomy, and his thoughts on different topics of science; but his manuscripts were irreparably lost in the fire by which the Servite library was destroyed, so that the precise data for determining the question whether or not he described the circulation of the blood before Harvey is, in a great degree, wanting.

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* Carcanus (Joan. Baptist). Anatomiæ Libri Duo, p. 12. Ticini, 1571.

† Portal, vol. ii. p. 13.

‡ Westminster Review, vol. xxxi. pp. 157, 158.

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* Biografia di Fra Paolo Sarpi. A. Bianchi-Giovini. Zurich, 1836.

† Bossuet. Histoire des Variations, book vii.

He was undoubtedly an extraordinary man, advancing at an even pace with Gilbert in his observations on magnetic phenomena; perfecting the mathematical labours of Vieta; correcting the errors of Anderson; throwing out hypotheses, since verified, on the spots in the moon, which he considered as irregularities of its surface, and laid down maps of those irregularities before Hevelius; assisting Galileo in the telescope, foreseeing the persecutions which his friend would have to undergo, and the way in which theology would array itself in opposition to his confirmation of the Copernican theory; attempting an explanation, by one universal law, of all the phenomena of celestial motion, and hazarding, before Newton, a solution of the gravitation of bodies, by supposing the earth an immense magnet, having the property of attracting all bodies surrounding it; anticipating Barrow in pointing out the difficulty of determining the precise places of objects as seen by refraction, Cavaleri on the subject of burning-glasses whose curve is generated by a parabola, Kepler and Gregory in their ideas of comparative astronomy*; and, to crown all, several writers attribute to him the discovery of the valves of the veins and of the circulation of the blood. In testimony of the former of these, we have the evidence of Fra Fulgenzio, the friend, companion, and enthusiastic historian of Sarpi and a brother Servite. His avouchment was founded on a manuscript, which is said to have contained an exposition of the mechanism and course of the circulation of the blood, left by Sarpi in the hands of Fulgenzio. In this curious document Sarpi states, in reference to the great work of Vesalius which had been presented to him, "There is really a great analogy between the things already remarked on and noted by me with respect to the movements of the blood in the animal body, and the structure and uses of the valves, and what I find indicated, though less clearly, in the 7th book, 19th chapter of that work." It appears, moreover, that Sarpi communicated his views on these matters to a few of his most intimate friends; and, lest his testimony should be doubted, Fulgenzio appeals from his own knowledge to that of Santorio and Asselinau, men eminent in science, who were still living when he wrote.*

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* Giovini (A. Bianchi), Biografia di Fra P. Sarpi; see also Westminster Review, vol. xxxi. loc. cit.

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* Opere del Padre Paolo, dell' Ordine dei Servi, &c. 1687. Vita del Padre, p. 44.

The remarks of Vesalius on the veins and arteries, in the 19th chapter of the 7th book, are not so unintelligible as Sarpi was disposed to make them. They show clearly that Vesalius thought, in common with all his contemporaries, that every part of the body received nutritious blood from the veins; although he performed an experiment to show that blood and spirit flowed in a direction from the heart. His precise words are: "Cæterum in venarum usu inquirendo; vix quoque vivorum sectione opus est: quum in mortuis affatim discamus, eas sanguinem per universum corpus deferre, et partem aliquam non nutriri, in qua insignis vena in vulneribus præscinditur. Item in arteriis, vivorum sectionem vix requirimus, quamquam licebit alicui arteriam in inguina procedentem nudare, vinculoque intercipere, ac intueri, partem arteriæ vinculo subtensam non amplius pulsare. Atque ita levi negotio observatur in arteriis sanguinem natura contineri, si quando arteriam in vivis aperimus. Ut autem certiores fiamus, pulsandi vim arteriæ inesse, aut contentam in arteriis materiam pulsuum opificem existere, verum a corde eam virtutem pendere præterquam quod arteriam vinculo interceptam non amplius sub vinculo pulsare cernimus, licebit inguinis femorisve arteriæ longam sectionem inducere, et canaliculum

We have also the evidence of Veslinguis, to whom Fulgenzio had shown Sarpi's manuscript, who represented it as a secret to Bartolinus, an important authority which has been neglected by M. Bianchi Giovini. Bartolinus, who lived at a period when the question had not been obscured by time nor confused by controversy, was so certain on the point, that he wrote with great clearness and precision on the question.[*] He also communicated it to his friend Waley, by whom we are informed that Sarpi was the first to discover the circulation of the blood.[†]

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ex arundine tam crassum assumere, quanta arteriæ est capacitas; et ita illum sectioni indere, ut superior canalis pars altius in arteriæ cavitatem pertingat, quam sectionis superior sedes; et ita inferior quoque canalis pars, deorsum magis ipsa inferiori sectionis parte protrudatur: ac dein vinculum arteriæ circumdetur, quod ipsius corpus super canalem stringat. Quum enim id fit, sanguis quidem et spiritus per arteriam ad pedem usque excurrit, verum tota arteriæ pars canali subdita non amplius pulsat.”

[*] “De circulatione Harveianâ mihi secretum aperuit Veslingius nulli revelandum, esse nempe inventum Petri Pauli Veneti (â quo de osteolis venarum habuit Aquapendens) ut ex ipsius autographo videt, quod Venetiis servat P. Fulgentius illius discipulus et successor.” Again he writes: “Intus in venis reperiuntur Valvulæ seu Ostiola nonnulla, quorum mentionem sub nomine cellularum ab Avicenna factam scribit Bauhinus. Aquapendens primum se inventorem asserit anno 1574, cui indicia hæc P. Paulus Servita, Venetus, dederat, quanquam Jac. Sylvium quoque utcunque cognovisse ex Isagoge ejus videatur manifestum. Post eum vero vel cum eo meminere harum valvularum Salomon Albertus, Archangelus, Piccolomineus, et Casparus Bauhinus: vix vero eas attingit Laurentius.” — *Thomæ Bartolini Anatome ex omnium Veterum* ***Recentiorumque Observationibus***, p. 594.

[†] “Quo (seculo) vir incomparabilis, Paulus Servita, Venetus, valvularum in venis fabricam observavit accuratius quam Magnus Anatomicus Fabricius ab Aquapendente postea edidit, et ex eà valvularum constitutione aliisque experimentis hunc sanguinis motum deduxit, egregioque scripto asservit, quod etiamnum intelligo apud

In addition to the above, Claude Peiresc, a personal friend of Fabricius, who was living in or near Padua, at the very period when the latter published his treatise "De Ostiolis Venarum," admitted that he remembered that Sarpi had discovered the valves of veins.[*] Flourens, in his "History of the Discovery of the Circulation of the Blood," objects to the evidence of Veslingius, Bartolinus, and Waley, as resting on that of Fulgenzio alone, and as being too traditional in character, and opposes the conflicting testimony of Harvey and Bauhinus to that of Fulgenzio and Peiresc.[†] However, it must be noted, that Fulgenzio himself does not claim the discovery of the circulation of the blood for Sarpi; but Veslingius it is who states that he had read a manuscript by Sarpi, belonging to his pupil and successor, Fulgenzio, in which the circulation of the blood was described.[‡] George Ent (Harvey's commentator and friend) admitted the testimony, but said, that whatever Sarpi knew of the circulation he learned from Harvey himself; and Ridanus (Harvey's chief adversary) gave no credit to Sarpi for the discovery.

But it is not merely on such opposing evidence that Flourens grounds his objection to the claim which has been set up for Sarpi: the document itself, on which the allegation rests, is without date; and, as in 1574, when Fabricius published his work, Sarpi was but twenty-two years old, previous to which the con-

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Venetos asservari. Ab hoc Servita edoctus vir doctissimus Gulielmus Harveius sanguinis hunc motum accuratius indagavit, inventis auxit, probavit firmius, et suo divulgavit nomine." — *Johannis Walei Epistolæ duæ de Motu Chyli et Sanguinis, ad Thomam Bartholinum*, 1660. 1st letter.

[*] See his Life, by Gassendi.

[†] Flourens' Hist. p. 118.

[‡] See his Syntagma Anatomicum.

troversy between Sylvius and Vesalius on the subject of valves, and the speculations of Columbus and Cæsalpinus must have been familiar to most anatomists, we may, with reason, be somewhat exacting for vouchers, on a point in which our national honour is somewhat concerned. Still, truth above all things; and, while we are severe in our requirements, we should likewise consider how far the objections raised are consistent with the known facts of the case.

Eloy, in his historical dictionary, affirms that Harvey, on his return to England, made a present of his own work to the ambassador of Venice in England, who communicated it to Sarpi, who made an extract from its contents, and that it was this extract which was referred to by Fulgenzio as the original.* This statement is probably based on the assertion put forth by George Ent, which is at once disproved by the fact that Sarpi died in 1623, five years before the appearance of Harvey's immortal work, which was published by Fischer, at Frankfort, in 1628.

From all that we read of Sarpi, he appears to have been a man who had a high sense of honour, and very little vanity. He was not, therefore, a man to suppress the discoveries of others in order to appropriate them to himself. With such a character, it is not only possible, but probable, that, dreading the clamour of superstition and intolerance which awaited every person who was bold enough to make an attack on the theories of Galen, he may have made a secret of his discovery, which may, in some degree, account for the expression of Veslingius, "secretum nulli revelandum." With respect to the objection which has been raised by Flourens against the manuscript itself, the gifted author whose paper in the "Westminster Review" I have freely quoted, has anticipated the answer, that, when Fra Fulgenzio wrote, both Santorio and Asselinau, to whom he appealed, were living; and it is difficult to suppose that he would incur the hazard of contradiction from them, and expose his labours in honour of his friend to irreparable discredit. Bartolinus published his work in 1641 (sixteen years before the death of Harvey). He had every possible opportunity of rectifying his statement, had it not been well founded; for he travelled in Italy from 1642 to 1645; was received a member of the Academia degli Incogniti, at Venice; and was resident a considerable time at Padua, where the memory of Fabricius was still fresh. But, more than this, Waley himself, a contemporary of Harvey, and one of his principal partizans, confirms the attestation of Bartolinus, not on the vague reports of Sarpi's friends, but on the surer authority of his own scientific information, and his correspondence with the learned.

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* Eloy (Nicholas F. J.), Dictionnaire Historique de la Médecine, Ancienne et Moderne, art. "Harvey." 4 vols. 4to. 1778.

And, finally, in relation to the argument deduced from Sarpi's age, it may be stated that his principal theses, which procured him a pension, an office at court, a public lectureship, and caused it to be said of him, that there would be but one Fra Paolo, are of as early a date as 1570, when he was but eighteen; and it was precisely during his four years' residence at Mantua, when these theses were written, that he was engaged in those studies (anatomy being one) which M. Bianchi Giovini has recorded.

It seems probable, therefore, that neither of these great men was in any way indebted to the investigations or discoveries of the other; and the merit still remains exclusively with Harvey of rendering the discovery available to science by tracing it to its consequences, which neither Cæsalpinus, Fabricius, nor Sarpi, accomplished. The controversy on the subject of revulsion and derivation, extending as it did throughout the whole of the sixteenth century, had an undoubted influence on the above researches; and they, in their turn, necessarily diverted the attention of anatomists to other systems of organs, which might have remained less carefully examined, and less accurately known, but for that otherwise unprofitable discussion. The osseous system, or skeleton, for instance, although invested with many superstitions and hypothetical notions, was pretty well known to the ancients as serviceable for the protection of the viscera, and for the determination of the direction and extent of motion and support of the different parts of the body. Nevertheless, it received its due share of attention during the sixteenth century. When Galen subdivided the vertebra into cervical, dorsal, and lumbar, the knowledge of the bones might be said to be tolerably good; but the most vague notions prevailed relative to the development of the skeleton, and many other details necessary for our present views in osteology, had to be made out.

Charles Etienne, and anatomists generally of his time, accepted the dogma of Galen, as it had been transmitted by the Arabs, that bones were formed from the dregs of the spermatic fluid, which, being incompetent to develope any bodily function, served the purpose of making bones. These he regarded as inert as the poles of a tent or the walls of an edifice (with which indeed they were compared), to give support and form*, notwithstanding that he was the first to describe the foramina in bones for the passage of the nutrient vessels. The periosteum or covering, he thought, was formed from the fat and oily portion of the bones; whilst, in the sutures of the skull, he only saw a means whereby the escape of the vapours from the brain was permitted.

His contemporaries, Achillinus and Carpi, imbued with a notion of the elaborate structure of bones, although they did not comprehend it, were wisely silent on points wherein Etienne so freely indulged his imagination.

Fernel followed Etienne, but with a more philosophic spirit. He examined and described the ligaments which connect bones better than any of his predecessors had done before him. His remarks on the ligaments of the spinal column and the radio-cubital articulation, the annular ligament of which he first described †, are perfect.

The skeleton received, perhaps, an adventitious attention in consequence of the popular belief that, in man, some one particular bone existed of an imponderable, incombustible, and indestructible nature, around which, as a nucleus, all other tissues and organs would collect and reassume their vital actions at the resurrection. ‡ Accordingly, every bone was tested by fire, for the purpose of discovering the hypothetical one, which was invested with respect and veneration, until Vesalius sagaciously recommended that such idle investigation, and the question of its existence, should be transferred to the more congenial researches of theologians, whilst he himself, regarding osteology as the basis of anatomy, gave so copious and faithful a description of the skeleton generally *, that modern authors have been accused of copying him.† In his delineation of the human shoulder and chest, as well as in the remarks which he made relative to the presence of clavicles, or collar-bones, in those animals only which use their anterior extremities as hands to carry food to the mouth, and their absence in all others (wherein he was not altogether correct, seeing that they are largest and strongest comparatively in those animals which fly or dig—as, for instance, in the bat and the mole), he displayed a knowledge of their peculiar use, in fixing the shoulder so as to communicate strength and extent of motion to the arm. Moreover he evidently recognised design in the mechanical construction of the solid framework of the body, which has been since so beautifully illustrated by Sir C. Bell, in his work on the hand.

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* Etienne (Charles). De Dissectione Partium Corporis Humani, libri tres, &c. Parisiis, apud Simonem Colinæum, 1545.

† See Portal's Hist. vol. i. pp. 385, 386.

‡ Ibid. vol. i. p. 407.

Many celebrated artists also cultivated anatomy so successfully, in spite of the repugnance which the church still entertained to the dissection of human bodies, that the sixteenth century may be regarded as the golden age for this branch of medical knowledge. In consequence of the interdiction imposed on the use of human subjects, there was a great temptation to take upon trust the assumed identity of form between

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* See his work entitled "De Humani Corporis Fabricâ," libri septem; Basileæ, 1543; with plates, which are attributed to the pencil of Titian. He also published some anatomical plates in 1539, which are greatly admired for the beauty of the drawing.

† The above charge has been made against Winslow by Portal. See his Hist. de l'Anatomie.

the several bones of many quadrupeds and those of man; and the fallacy may be traced in the great majority of anatomical writers of that period; but the Duke of Tuscany, in order to dispel the illusion, was sometimes obliging enough to send a living criminal to anatomists, who, as Fallopius tells us, dispatched him after a fashion of their own*, so that a more truthful knowledge of the human subject might be obtained.

In 1532, Albert Durer published a work which showed him to be tolerably versed in human anatomy†; and Michael Angelo, who may have gained some of his anatomical lore from the practices suggested by Fallopius, engraved several anatomical plates from his own designs, which are said to be, unfortunately, lost.‡ Leonardo da Vinci also applied himself with great diligence to human anatomy, and produced a collection of drawings for his friend Marco Antonio della Torre (an enthusiastic professor in Pavia) representing the bones covered with muscles, as he himself had dissected them, which, when inspected by Dr. William

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* "Quem interficimus nostro modo et anatomisamus." Sprengel suggests that "nostro modo" implied, by opium, but it is a mere conjecture. See Hallam's Literary History, vol. ii. p. 345.

† "De Symmetriâ partium in rectis formis humanorum corporum." See Pilkington's Dictionary of Painters, art. "Durer" (Albert).

‡ Sprengel, vol. iv. p. 7; see also Vasari, art. "Buonarotti." Notwithstanding the assertion of these two authorities, one of the designs of Michael Angelo is still extant, a figure seventeen inches high, the right arm and leg being unfinished, showing some of the proportions of the human body, and by the side of it, an attempt to demonstrate a canon of proportions by a series of segments of circles. This precious relic is in the possession of William Russell, Esq.

Hunter, inclined him to believe that Da Vinci was the best anatomist of his age.*

Vasari informs us, in his "Lives of Painters," that Titian and John Calcar did for Vesalius what Da Vinci had done for Della Torre, and so co-operated with his own remarkable talent in raising him to the eminence which his name acquired.

Numerous details are here necessary which must be unavoidably tedious; but it will be readily understood, that, in the retrospect of the course of our career, it is desirable to dwell on the particular circumstances of every past period, which may serve as a landmark to estimate the successive impulses given to our profession from time to time by the ability and diligence of its members. I may, however, relieve the reader of much that is irksome by a reference to the Chronological Table for an account of each individual discovery, as far as it has been found possible to determine its date and author, as well as for the general conclusions from the whole. Therein we have evidence, that a spirit of free enquiry was manifested, although many physicians reverted to the theories of the ancient Greeks, as to a new source of enquiry.

Bolder spirits, however, were not wanting, who pushed their investigations beyond the limits set by those whom they had begun to venerate; and they were regarded as the heretics and protestants in science, just as Luther and Zwinglius were accounted heretics and protestants in religion. The dread of contravening what Galen had taught was so unreasonably great, that Vesalius, in exposing his errors, roused a host of enemies imbued with such blind zeal*, that, when human bones, differing from the description which the anatomist of Pergamus had given of them, were placed before Sylvius, he preferred to regard them as aberrations of nature, rather than believe that Galen had derived his knowledge from any other source than man. The latter had said that the human sternum, or breast-bone, was composed of seven pieces, but when Vesalius showed one composed of three pieces only, and ascribed the error to an examination of the monkey, Sylvius replied that, in the time of the Greeks, men were of larger dimensions, and had seven elementary pieces to the sternum. Again, when Vesalius showed that the humerus and femur (arm and thigh bones) which Galen had depicted like those of the monkey, were less curved in man, Sylvius urged the ridiculous argument that the usage of tight dresses had straightened those particular bones!

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* These drawings are now in the possession of Her Majesty; but many of them were engraved and published by Joseph Chamberlaine, in London, in 1790. See Pilkington's Dict. art. "Leonardo da Vinci."

John Philip Ingrassias, the great restorer of anatomy in the Neapolitan school, was a contemporary of Vesalius. He enriched osteology by several discoveries, although he professedly wrote a mere commentary on Galen †; but, so carefully did he examine the skeleton, and so accurately did he describe it, so absolutely untainted also was he with the prejudice of his coevals, that, instead of being the servile follower of Galen, whose book he illustrated, he constituted himself the judge of his merits, and, in many respects, far surpassed him.

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* Puteus, Dryander, Etienne, and Sylvius were the chief opponents of Vesalius in defence of Galen.

† In Galeni librum de Ossibus Commentaria. Panormi, 1603. Ingrassias was born in Sicily A.D. 1510, and died A.D. 1580.

The deep sense of imperfection in the received systems of anatomy, and the restless longing for truth which are manifest in the work of Ingrassias, are equally apparent in the writings of other authors; thus we find in Realdus Columbus* a more accurate account of the holes in bones, and the vessels which enter them for the purpose of nutrition and growth, than in Etienne, to whom Portal has attributed the discovery of the foramina, although Columbus claimed it for himself. The foramen in the posterior part of the body of each vertebra he undoubtedly first pointed out; and, his anatomical genius leading him, as it did, to investigate every part of the body, he turned the knowledge thus acquired to account, as we have already seen, in propounding the doctrine of the pulmonary circulation. He also first recognised those membranous sacs which exist in every part of the body between the tendons of muscles and bones, for the purpose of lubricating their surfaces as they play over each other. This discovery is generally attributed to Albinus; but M. Portal has shown that the honour is due to Columbus, who, like Albinus, called them bursæ.† By the same authority the merit of having discovered a third bone (the stapes) in the tympanic cavity of the ear is likewise attributed to Columbus.‡

The celebrity acquired by Vesalius, which excited the jealousy and animosity of Sylvius, served but to fan a flame which had already been kindled in the mind of Fallopius; and thenceforth he devoted himself more exclusively to anatomy than he had done before; notwithstanding that he declared there was nothing more to desire beyond the complete and lucid descriptions which Vesalius himself had given.[*] As the latter, however, had dared to question the infallibility of Galen, men's minds were divided between the authority of the two, and Fallopius, after duly investigating both, pronounced in favour of Vesalius. He did not, it is true, make any considerable additions to the knowledge of the human skeleton; but his observations on the nutrition, growth, and connections of bones were conceived in a more truthful and philosophic spirit than any which had been made before. He disputed the discovery of the stapes with Columbus, and affirmed that he wrote concerning it to Cananus, Columbus, and Madius, but that not one of them knew it.[†] He gave the name to the tympanic cavity, and accurately described the position and direction of the drum of the ear (membrana tympani).[‡]

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* De re Anatomicâ.

† Portal, vol. i. p. 549.

‡ Ibid. vol. i. p. 544.

His pupil, Coiter, devoted his almost exclusive attention to the fœtal skeleton. In his work[§] he shows himself thoroughly imbued with the tastes of his master, and perfectly familiar with the osseous system, not only of man, but of many quadrupeds, birds, and fishes also.

Lest the notice of several other names, which well deserve their meed of remembrance, should be deemed needlessly tedious, I shall confine myself to that of Eustachius, Professor of Anatomy in Rome, who passed his entire life in the pursuit of anatomical research. Whether dissecting animals or man, the whole of his investigations were carried on in relation to the latter, whose structure he purposed to illustrate in a series of copper plate engravings, on which he bestowed great pains. They were not quite completed when he died, in 1574, and were subsequently lost sight of for nearly 150 years; when found they were presented by Pope Clement XI. to Lancisi, his physician, who published them in 1714; but a later, and more correct edition was published by Albinus, in 1744.* Eustachius discovered and described the passage of communication between the ear and the nose, named the Eustachian Tube.

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[*] "Dum absolutissimum Andrææ Vesalii opus anatomicum legerem, in quo mihi videbatur nihil posse desiderari quod aut ad copiosam explicationem, aut magnitudinem, aut substantiam, aut speciem vel usum, aut denique quod ad integerrimam humani corporis descriptionem pertineret."

[†] Portal, vol. i. p. 576.

[‡] Ibid. vol. i. p. 575.

[§] Externarum et Internarum principalium humani Corporis Partium Tabulæ atque anatomicæ Exercitationes Observationes que, variæ novis, diversis, ac artificiosissimis figuris illustratæ. Norimbergæ, 1573.

Conformable with the intimate relation which exists between bones and muscles, we naturally pass on to enquire what amount of labour was bestowed on those fleshy masses, the special endowment of which is contractility, and how far those labours were successfully pursued. Constituting, as the muscles do, the chief portion of the entire body, and determining the external form and expression, their developement, shape, and position are invested with peculiar interest, not only to the physiologist, but to the artist also; and it was doubtless in an æsthetic point of view that Leonardo da Vinci depicted the forms, proportions, and relative positions of the muscles which he himself had dissected.

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* Tabulæ Anatomicæ clarissimi viri Bartholomæi Eustachii, quas e tenebris tandem vindicatis et sanctissimi Domini Clementis XI. Pont. Max. munificentiâ dono acceptas, præfatione notisque illustravit Jo. Maria Lancisius, intimus Cubicularius et Archiater Pontificis. Romæ, 1714. Eustachius's friend, Pinus, is said to have preserved them during his lifetime, and to have transmitted them to the family of Rubens.

In extending our observations still further back into the course of time, the study of those precious relics, which have been transmitted to us by the ancient sculptors of Greece, and which show how perfectly the human form was translated into marble by marking the muscular divisions with so much boldness, simplicity, and truth, leads us naturally to think that Phidias at least must have possessed an accurate general knowledge of the muscular system; but in contemplating still further the most perfect *débris* of ancient art, such as the Hercules in the Vatican, the Theseus and the Ilyssus, it is evident that the master-hand had but half to do in the mere imitation of the living model. Thought also stepped in to give life, and something more than life, to the sculptured figures: for not only do they possess all the truthfulness of living beings, but surpass them in linear harmony, in the expression of the ardour of the senses, the energy of action, and the superhuman developement of intellect. In a word, they are so idealised, and yet so real, that the sculptor appears to have comprehended all that was necessary in chiselling the muscular masses; and accented them accordingly. All that was useless in details he equally comprehended, and these he omitted; thus creating a type of heroic form and force, which appears to be wholly incompatible with an imperfect knowledge of the muscular system.

And yet we find but comparatively few details concerning the muscles, in the works of the ancients. Hippocrates simply speaks of them as subservient to locomotion, although he must have been conversant with their nature; for in his work on surgery, he alludes to the treatment of limbs which have been atrophied from the compression of tight bandages and the loss of exercise during the process of treatment for fractures, obviously defining the consequence of muscular degeneration. Aristotle, too, must have carefully examined the muscles; for it was he who discovered their peculiar endowment of contractibility when examining the intercostal muscles; but Galen was the first to speak of muscles in detail, and he was evidently familiar with many, although he erred concerning the nature of their structure, and supposed them formed of tendons and nerves.* After Galen we find no writers referring to individual muscles until the ninth century, when Theophilus† described the muscles of the eye-lids; and subsequently, Avicenna, in spite of the interdiction imposed on him by his religion against touching the dead, describes four muscles of the eye as joining to form one common trunk (the four recti muscles) and two others, making six in all, as appertaining to the eye. Of the cremaster muscle he also speaks, as well as of the sphincter vesicæ‡. Mundinus, in the fourteenth century, implicitly followed Galen in his description of the muscles, and made no advance in the amount of knowledge then possessed concerning them.

In the sixteenth century Gabriel de Zerbi led the van, and gave a succinct account of the muscular system as far as it was known up to that time.§ Bérenger Carpi subsequently improved on him by illustrating the muscles in six plates*, somewhat grossly it is true, as did Etienne after him; but by such means myology gradually acquired that amount of attention which led to the description of several muscles, which had never before been regarded as distinct and separate. It is recorded of John Gonthier, for instance, that he discovered several of the small muscles of the hand, though not the interosseous muscles of the metacarpus, for which he has generally had the credit, inasmuch as Galen knew them previously.†

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* Sprengel, vol. iv. p. 21.

† De Humani Corporis Fabrica. This work was translated from the original Greek into Latin, and published in Paris by Paulus Crassus Patavinus, 1555.

‡ Portal, vol. i. p. 148.

§ Anatomia Corporis Humani, et singulorum illius Membrorum. Venetiis, 1502.

Had Sylvius been as accurate in his description of every other part of the body as he was in that of the muscles, he would have been one of the greatest anatomists of the sixteenth century; but he appears to have acted rather on the impulse of personal feeling, than on that of honest conviction; for, being himself manifestly imbued with the prevailing instinct of reform, he rejected its proper logic, and fell back on the impotence of ancient authority to gratify his animosity, and sustain a squabble which so seriously compromised and degraded the profession. Vesalius, probably ashamed of the disgraceful feud, answered the strictures of Sylvius, Puteus, and other enemies, under the assumed name of Cuneus‡, describing the several discoveries which he had made, and showing that the attention of these rivals in science was directed to the same objects of investigation, as naturally it would be. But how legitimate an application of history to the custom of our own times, when too many able men, after collecting, with earnest toil, all that they have been able, of the knowledge of their predecessors, and, when in possession of a power which might be turned to better service, reject all, for the senseless gratification of animadverting upon the errors of their contemporaries, instead of extending the boundaries of science themselves! Although Vesalius, in his great work, gives a comprehensive account of the muscular system, attacking, in the first instance, the error into which Galen had fallen in relation to the structure of muscles, he failed to substitute a correct exposition of it himself (as, indeed, it was impossible to do, until the modern microscope revealed to us the marvellous texture), and betrayed the very source of some, at least, of his knowledge, which he censured in others; for, in describing the muscular apparatus of the eye, he speaks of what is now known as the *choanoid*, or funnel-shaped muscle, interposed between the recti muscles and optic nerve, as existing in man[*], and represents the interior of the human nostrils as supplied with muscles to close those orifices, such as are found in the seal.[†]

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* Isagogæ breves, perlucidæ, &c. in Anatomiam Humani Corporis. Bononiæ, 1524.

† Portal, vol. i. p. 346.

‡ "Gabrielis Cunei Apologiæ Francisci Putei pro Galeno Examen." This is contained in the edition of Vesalius, published by Boerhaave and Albinus.

These, and other errors, were pointed out by Gabriel Fallopius, a native of Modena, who acquired so great a reputation, that he was called the Æsculapius of his age: notwithstanding which, the details of his life are imperfectly known.[‡] If we may believe the "Biographie Universelle," he was, at an early age, a canon of Modena, but quickly renounced his clerical preferment for the study of medicine. After teaching anatomy, his favourite pursuit, at the universities of Ferrara and Pisa, he was selected by the Venetian Senate to occupy the chair of anatomy and surgery at Padua, where, by correcting the errors, he drew on himself the jealousy of Vesalius.* His discoveries in myology will be found in the Chronological Table ; but, after all the fallacies which he dispelled, and the truths which he announced, as, for example, the fibrous structure of the muscles, which had not before been noticed, one thing was still wanting to facilitate the study of these moving powers, and that was supplied by Gaspard Bauhin, a native of Basle, and pupil of Fabricius, who assigned to each muscle the name it bears at the present day†; thus rendering a great service to anatomy, as the *pairs* by which these organs had been, for the most part, distinguished up to his time, led to much perplexity and misconception.

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[*] Opera Omnia, lib. ii. cap. xi.

[†] Ibid. lib. ii. cap. xiii. "*Inque interiorem* alæ regionem insertus, illam introducit et colligit," &c.

[‡] He was born in 1523, and died at Padua in 1562.

Many other names deserve notice here‡; but, to avoid prolixity, I will only refer to two or three countrymen of our own, for the purpose of showing that, in the midst of this cheerful and active picture, clouds appear to damp our national vanity, whilst we are in the very process of self-congratulation.

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* Portal, Observationes Anatomicæ. Venetiis, 1561.

† Anatomica Corporis virilis et muliebris Historia. 8vo. Lugd. 1597.

‡ Eustachius, in his "Tabulæ Anatomicæ," represented in fourteen plates the muscular system, wherein the structure, position, connexions, and figures of the separate muscles are indicated with the utmost precision and truth. After him Jean Baptiste Cannanus, professor at Ferrara, published a work on the muscles, which is extremely scarce. A copy of it, entitled "Musculorum humani Corporis Picturata Dissectio," per Jo. Bapt. Cannanum, &c. 27 Tab. 4to. exists in the Dresden Gallery. It is a book without date or locality. Next, in 1583, Felix Plater published a work, "De Partium Corporis humani Structurâ et Usu libri tres, tabulis methodice explicati, iconibusque accurate illustrati, Basil," wherein he follows the order adopted by Vesalius, but gives nothing new. Fernel is reported by Portal to have written especially on muscles, but inaccurately. Thomas Gemini, of London, a fine engraver, published his "Com-

Joannes Caius, or John Kaye, of whom it will be necessary to speak hereafter, was a native of Norwich, and received his early education at Gonville Hall, Cambridge, where he was distinguished by his great and sound acquirements in the Greek language. He studied medicine at Padua under Montanus and Velasius, and subsequently took his doctor's degree at Bologna. On his return to England, a stanch supporter of Aristotle and Galen, he practised, and quickly became celebrated at Shrewsbury, from whence he was summoned by Henry VIII. to deliver anatomical lectures to the surgeons of London.* In 1544, he wrote on the muscular system ("Librum de Motu Musculorum"); but nothing new is attributable to him, nor to any other of our countrymen of the sixteenth century, and, if we may judge from works written even a century later, we must conclude that England was not pre-eminent as a school of anatomy. For instance, in "A Treatise of All the Muscles of the Whole Body, by Alexander Read, Doctor of Physicke, a Fellow of the College of physicions of the famous city, London,

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pendiosa totius Anatomicæ Delineatio ære exarata," Lond. 1545, giving the figures of Vesalius, but forgot to name the original author of the delineations, as did also Valverda, in 1556, who wrote almost a transcript of Vesalius, illustrating it with copper-plates, handsomer but not truer than the original; and finally Ligæus is celebrated for having written in Latin hexameters an anatomy of the body, "De humani Corporis Harmoniâ," libri quatuor, Lutet. 1555.

* Hecker's Epidemics, p. 301.

and a brother of the Worshipfull Company of Barbour Chirurgians of the same city," who, in an introductory address to the Earl of Bridgewater, sets forth that, "according to custom, about Shrovetide, he was moved by the Worshipfull Company to discourse of the muscles of the body of man;" notwithstanding the discovery of Harvey, he represented the veins as affording nourishment, the arteries life, and the nerves motion. "The fibrous flesh," says he, "is extended onely according to the straight position of the fibræ. The fibres of every muscle are always straight: every muscle has a proper membrane, which either springs from the tendon, or is framed by nature in the very first conformation of the parts. The tendon, or sinewey-like substance, beginneth at the head of the muscle, passeth through the belly of it, and endeth at the taile, as manifestly appeareth in the foot of a cock. The efficient cause of the action of muscles is the soule, moved by its appetite, wherein it useth three instruments, the braine, the nerve, the muscle; the braine receiveth the charge, the nerve carrieth it to the muscle, and the muscle doth perform the action." The oblique muscles of the orbit Read calls circumagentes (winders about), and amatorii, or love-makers. The whole of the book is in keeping with the above extracts, and far inferior, in every respect, to any previously mentioned, except in its faults. A more ostentatious work, by John Browne*, is an improvement on the latter, in consequence of containing the observations of Borellus; the coloured plates of the muscles, however, are execrable.

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* Myographia Nova, or a Graphical Description of all the Muscles in the Humane Body as they arise in Dissection, by John Browne, Sworn Chirurgeon in ordinary to the King's most Excellent Majesty, and Senior Chirurgeon of St. Thomas's Hospital. 1698.

It was not necessary to prescribe any course of investigation which might subvert the mediæval interpretations of Aristotle and Galen, with respect to the function of the nervous system. That sensory apparatus lying, as it were, between the impulses of the world without, and the actions resulting from volition within, was a perfect enigma until the systematic study of it was initiated by the grand discovery of Sir Charles Bell.

Hippocrates, as we have seen, regarded the brain as a glandular mass, serving the purpose of imbibing the superfluous humours of the heart ; yet he held it to be the seat of the soul : and Aristotle, after him, believed it to be an inert insensible mass, composed of earth and phlegm without blood, designed by its cold quality to moderate and keep in subjection the heating influence of the heart.

Erasistratus, indeed, seeing that the brain of man, like that of animals, was divided into two lobes, each containing a cavity or ventricle, and that all the organs of sense had nervous communication with it, believed it to be the principal of all organs, the seat of the soul, and the throne of its mysterious empire. He also vaguely guessed that separate nerves had separate powers ; and the belief was entertained by anatomists after him. But, when no structural difference could be detected between the nerve subservient to feeling, and the nerve originating motion, when it is considered that some three or four inches of nervous matter connects us with myriads of worlds infinitely distant, as well as with objects immediately within our grasp, that each particular nerve has its own inherent power, which cannot be exercised vicariously by any other, and yet that all are constructed like the fibres of the brain, the instrument of moral and intellectual manifestations, is it to be wondered at that all sorts of chimerical hypotheses have been advanced relative to a system which is still, to a great degree, the mystery of mysteries?

Herophilus, after he had traced the arachnoid membrane into the ventricles of the brain, assumed that those cavities contained the soul: and much the same vague notion existed up to the sixteenth century, when Fernel spoke of an expansion and contraction of the ventricles within the skull as a means whereby the vital spirit was forced into the nerves.*

The brain was not a complete *terra incognita* to Galen; for he was familiar with its general configuration and consistence, its cavities and their intercommunications; he was cognizant of the corpus callosum and fornix, and of the markings on the lower surface of this latter organ, called the lyra, or corpus psalloides; he knew too the eminences called the nates and testes, as well as the pineal gland, or conarium, which *he* dignified as the seat of the soul. The minute veins in the centre of the choroid membrane, he first described, and they are now denominated the Venæ Galeni.† Of the nerves he recognised seven pairs proceeding from the brain‡, and those of the spine going out in pairs to be distributed to various parts of the body.

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* Fernelius Ambianus (Joannes), De Abditis Rerum Causis.

† The discovery of the septum-lucidum and fornix Sprengel attributes to Bérenger. See Sprengel, vol. iv. p. 65.

‡ The 1st pair of Galen were the optic; the 2nd, the motores oculorum; the 3rd, the inferior maxillary branches of the 5th pair; the 4th, the superior maxillary branches; the 5th, the auditory nerve, or facial and acoustic combined; the 6th, the pneumo-gastric; and the 7th, the lingual.

Although an epoch was created by the numerous discoveries of individual parts, the old Galenic hypotheses respecting the function of the nervous system was generally maintained. The vital spirit was supposed to be centred in the ventricles of the brain, and diffused from them to the several parts of the body. When the observations of Vesalius, that the arteries contained blood, came to be known, the conjecture acquired a supplementary evidence, and the soul was considered to be a secretion from the arterial blood. Servetus amongst others adopted this view, and fixed upon the choroid plexus as the organ destined to supply the secretion; but some few, with Cesalpin at their head, clung to the old Aristotelian dogma, that the heart was the seat of the soul, from whence all the nerves must necessarily take their origin, in spite of the manifest testimony of the nerves themselves to the contrary.* A most ingenious attempt was made to explain away the difficulty, by supposing, with Aristotle, that the arteries conveyed the nervous energy from the heart to the brain, where they lost their peculiar characters to assume the form of nerves; and the sensibility of the heart to every emotion, together with the insensibility of the external portion of the brain, were seized on as additional facts to corroborate the conjecture. To destroy this part of the argument, Varolius described the brain in the light of a righteous judge curtailed of every affection, but so constituted as to receive all impressions and to pass judgment on them.† It would be a waste of time to occupy the reader with the errors committed by many of the authors of the sixteenth century, in their descriptions of the source and distribution of the several nerves. The exploded theories, however, are both interesting and useful; for the same form of reasoning is so deeply rooted in us, as it is in all men who have to deal with phenomena in which artificial experiments have a very limited range, that we may set forth its insufficiency for the expression of a sentiment as well as for the exhibition of the practically mischievous tendency of such reasoning, unless there be a clear perception of the object to be aimed at, and a systematic means, used in the right direction, for its attainment.

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* Sprengel, vol. iv. p. 65.

† Ibid. vol. iv. p. 67.

The diligence with which every part of the human body was ransacked will be better appreciated by a reference to the description given of the viscera, by the anatomists of the period, than by the imperfect historical remarks which have been made relative to the osseous, muscular, and nervous systems. A knowledge of the form and position of the different viscera was doubtless possessed even by Pythagoras and Democritus, who availed themselves of such opportunities as the sacrificing priests and embalmers of Egypt could give them in the pursuit of their occupations; but until the time of Aristotle and Praxagoras, if we except the "Treatise on the Articulations" by Hippocrates, we are acquainted with no anatomical work whatever: although it is obvious that Hippocrates was familiar with all the great viscera, whatever notions he may have entertained concerning their structure and functions. Erasistratus, indeed, was the first to speak from careful observation of the viscera of the human body, but it was Herophilus who first boldly proclaimed the value of anatomy as the basis of medicine; and he was nobly supported by the verdict of Galen, who, in his great work* showed the importance of it, although, unfortunately, he lived at a time when both Jews and Greeks forbad the very contact of a dead subject. He was, therefore, obliged to obtain all that he knew of anatomy from animals; and, as far as the viscera were concerned, he could do it most effectually, although not, in all cases, correctly, Nevertheless, he wrote concerning each viscus in particular, and attributed to the liver, as we have seen, the important function of sanguification, whilst he regarded the spleen as an organ formed to pump off the too gross and viscous humours engendered in the process.

The entire anatomical knowledge of the Saracens came second-hand from Hippocrates and Galen; but Avicenna appears to have had very comprehensive ideas of the viscera, and accepted the names given by Aristotle to the different portions of the intestinal canal. Well might the favourite opinion, that society is retrogade, be entertained by the ancients, when in anatomy, as in most of the sciences, it was acknowledged that the learning of nations had fallen from a higher estate, and that, for many centuries, not one single important discovery had been made to counteract the notions of that golden age when earth was blended with heaven, and when humanity held frequent and familiar converse with the gods. It is true, one man stands forth in our historical chart, like an outlier in front of a mountain chain, who appears to have been more fortunate in his opportunities than either his predecessors or followers for very long periods. The treatise of Mundinus was founded on actual dissection of the human body, and, as such, was made the text-book of the Italian universities until the middle of the sixteenth century.[*] He retained the name of syphac which the Saracens had given to the peritoneum, whilst the viscera themselves covered by the membrane in question, he, like the Saracens, called the myrach; but to the valves of the heart he first gave the name of ostiola.[†] He carefully examined all the viscera, without making any addition to the knowledge possessed by Galen; nor was it until the period of which we are treating that the hope not only of emulating but of surpassing the ancients began to be felt.

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* De Usu Partium.

Zerbi, Achillinus, and Bérenger, were the pioneers of the age, as our Chronological Table will show; and, in 1536, Nicholas Masson first described the reflections of the peritoneum as a shut sac, but continuous membrane, covering the viscera in such a manner as that they lie external or posterior to it.[‡] This is still the pons asinorum to the modern student of anatomy. He also described the structure of the kidneys (as far as it was then possible to describe it), especially the tubular portion, and demonstrated them as organs designed for the secretion of urine, as well as their communication with the bladder by means of the ureters.

But Vesalius undoubtedly knew more of the viscera generally, and particularly of the brain, heart, and lungs, of which we have already spoken, than did any of his predecessors or contemporaries; although, if we were to judge of him by a very curious and interesting coloured print, arranged in layers so as to show one part behind another, which he published*, we should form but a low estimate both of him and them.

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[*] Hallam's Literary History, vol. i. p. 119.

[†] "Et habet (cor) tria ostiola quæ aperiuntur ab extra ad intra." *De Cordis Anatome.* Curtius, p. 148.

[‡] "Anatomiæ, liber introductorius: in quo quamplurimæ partes, manifesactiones, atque utilitates humani corporis nunc primum tantur, quæ à cæteris tam veteribus quà recentioribus prætermissa fuerunt." Venetiis, 1536.

When every organ was known there remained little to do in the way of discovery; nevertheless the energy and zeal with which each viscus was examined can be estimated only by perusing the treatises of such men as have been named, as well as of Etienne, Sylvius, Rondelet, Fallopius, Bauhin, Eustachius, and a host of others, who emulated and surpassed the ancients by adding almost daily some new fact to the knowledge already acquired of the normal anatomy of the viscera.

Associated with the above, a few remarks on a system of vessels, hitherto unnoticed, may not be out of place here.

As early as the third century before the Christian era, Erasistratus, whilst in the act of opening a goat, saw in the mesentery, besides other vessels, some filled with a white fluid (the milk, as he thought, just before drunk by the animal), which had found its way into the arteries.† His contemporary, Herophilus, also recognised vessels in the mesentery, which did not, like all others, terminate in the portal vein, but in the mesenteric glands.‡

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*. "Anatomie très-utile, pour cognoitre les parties intérieures de l'homme et de la femme, composée par Maistre André Vesali, avec ample déclaration des veines principales, et manière de bien saigner, très-utile et necessaire aux Médecins et Chirurgiens, et autres, qui ont désir de cognoitre la situation des parties, marquée par lettres et nombres en la figure et position d'icelles." Of this plate I have been favoured with an examination by William Russell, Esq. in whose possession it is.

† Portal, vol. i. p. 46.

‡ Haller, vol. viii. p. 3, and Portal, vol. i. p. 51.

It is almost wonderful if, as Celsus informs us, they dissected the bodies of living criminals, that they did not see the lacteals in the human subject, but they did not; nor was the subject again noticed until Marinus, in the first century, and then Galen, quoted the observation of Erasistratus, and added thereunto his own opinion, that the white fluid was taken up by the veins of the intestines, and carried to the liver for the purpose of sanguification. Nothing more was said or heard of these vessels until the middle of the sixteenth century, when Eustachius discovered, on the fore part of the spine of a horse, lying by the side of a large vein (the vena-azygos) another vessel which was neither artery nor vein, but which contained a transparent fluid, for the purpose, as he thought, of nourishing the thorax.* His discovery attracted no notice, nor did he attempt to follow it up. Again, in 1532, Nicholas Massa observed some canals passing from the confluence of the renal vessels towards the heart†, which Sprengel assumes to have been lymphatics; and Fallopius saw some vessels passing from the surface of the liver to the pancreas; these vessels he described as containing a yellowish fluid.‡

Such was the amount of knowledge respecting the lacteal and lymphatic system up to the beginning of the seventeenth century.

The last subject which remains to be noticed in this epitome of anatomical knowledge, as it existed when

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* Haller, vol. viii. p. 4. Eustachius noticed the dilated portion of the thoracic-duct (the receptaculum chyli), in the middle of the lumbar region, but confessed his ignorance of the manner in which it terminated. See Eustachius, De Venâ Sine Pari, p. 280.

† Sprengel, vol. iv. p. 44.

‡ Ibid. vol. iv. p. 45.

Harvey enunciated his great discovery, is one which I have already alluded to as a favourite theme of most ancient writers.

The reproductive system and the physiological questions connected therewith were more assiduously investigated than any other organs and functions, and certainly there were none wherein the ignorance of the operations of nature were more conspicuously exemplified. The organs themselves, which are appropriated to the perpetuation of the species, were, with some few exceptions, tolerably well known from the earliest periods: of those processes, however, which follow fecundation, and terminate in the marvellous genesis of a new being, it is no disparagement to such men as Vesalius and Fallopius when we assert that they utterly failed to explain them.

The exceptions above referred to are those appendages to the uterus known as the Fallopian tubes, which are generally thought to have remained undiscovered until the sixteenth century, when Zerbi distinctly alluded to them; but there is a curious passage in the writings of Ruffus of Ephesus, of whom Galen speaks as the best anatomist of the second century, referring to two varicose and tortuous vessels passing from the testes (as the ovaries were then called) to the cavity of the uterus, which Portal reasonably conceives to be the first allusion made to these canals.* But Fallopius, in his zealous pursuit of the anatomy of the viscera, undoubtedly preceded all others in giving a circumstantial account of their course, volume, position, and structure. He first cut into them and found them hollow, but could with difficulty imagine himself the author of the discovery; he denominated them, however, the tubæ seminares, and left posterity to attach his own name to them when their real purpose came to be better understood.

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* Portal, vol. i. p. 74.

The most remarkable circumstance to be noticed in this part of our history is the disagreement which prevailed amongst anatomists relative to the existence of that membranous fold which has received the name of hymen. As early as the second century the question was obviously mooted, for Soranus at that period denied its existence. Mundinus denied that it was a mere imaginary substance, but described it as situated high up, near the cervix uteri; and he was followed by Achillinus and Fernel. Vigo, Bonaccioli, and Fallopius, gave a correct account of its structure and position; but Le Vasseur, and many who followed him, spoke of it as a nonentity, and referred to Galen, who does not mention it. If, however, instead of appealing to that authority, they had studied the human subject and formed their judgment thereon, they would have discovered the folly of placing a blind faith in any one.

In thus attempting to give a separate and special sketch of each system of organs, so as to convey in one continuous narrative those events which have marked, not only the course of improvement in bygone ages, but the status of one particular period, I shall, doubtless, be excused for omitting many of those hypotheses which served to throw no light on the progress of our knowledge; and in no branch of medicine is the exercise of that reticence more necessary than in what embraces the numberless conjectures which were formerly made in relation to the reproductive functions. I will therefore notice the most salient propositions only, and refer back to the earliest period of history, when it was imagined that the testes and ovaries were homologous bodies, each designed to produce their own peculiar secretion, the intermixture of which was essential for, and constituted the germ of, the new being.* Such, in effect, was the assumption of Pythagoras, who further surmised that, at the moment of conception, a substance imbued with a warm vapour, descended from the maternal brain to form the reasonable soul, whilst the products above mentioned, uniting in the uterus, gave form and substance to the material body of the embryo. All this, according to his hypothesis, was accomplished in forty days; but, in conformity with his conceit of harmonious numbers, the phenomena of intra-uterine life were completed only at the expiration of the seventh, ninth, or tenth, month; previous to which, the soul was supposed to take up its final abode in the brain, the passions in the heart, and the future destiny of the incipient individual was determined.†

Akin to the above theory was the notion of Aristotle, that fecundation consisted in a concurrence of the seminal with the catamenial fluid, which gave rise to the scholastic dogma relative to the reproduction of the species; and the question of many subsequent ages was, at what time the reasonable soul entered into, or was developed in, the embryo, and what share each parent possessed in the procreation of the latter.

The theories which have been explained presupposed that both were equal contributors; but Diogenes the Stoic‡, and subsequently Galen, who had very correct notions of the female organs, admitting the ovaries as the homologues of the testes, considered that the secretion of the former merely afforded nourishment to the latter, from which it was imagined all the tissues of the fœtus were formed. Together with this view, Galen adopted the supposition which Haller attributes to Hippocrates*, that the male embryo originates from the right testis, and is conceived in the right sinus of the uterus, whilst the female has its germ in the left.

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* Haller, lib. xxix. p. 13.

† Portal, vol. i. p. 20.

‡ Haller, lib. xxix. p. 5.

Not a single fact was added to the positive knowledge which Galen possessed until the ninth century, when Theophilus observed that the testes were almost entirely composed of capillary vessels†; but by far the greater part of authors who wrote on the subject (as almost all anatomists did) indulged in idle speculations, a good average sample of which may be quoted in a work of Constantine of Salerno, who, in the twelfth century, wrote a treatise on the planetary influence over the seminal fluid, and, consequently, on the future man; he also described certain aliments calculated to reawaken the erotic sentiment when on the wane.

In the following century Albertus Magnus is thought by some to have written a collection of secrets‡ to gratify the prurient taste of a lascivious priest, but with the colourable pretext of giving assistance in the confessional. The authenticity, however, of the work in question is generally doubted,§ and the prevailing belief is that it was written by one of his disciples; but the inference with respect to the licentiousness of that and the three following centuries, especially of the depravity of the priesthood, is confirmed by every authority on the subject.*

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* Haller, lib. xxix. pp. 2, 3.

† Portal, vol. i. p. 130.

‡ De Secretis Mulierum et Naturæ. Amsterdam, 1655.

§ Penny Cyclopædia, art. "Albertus Magnus."

In the fifteenth century Matheus de Gradibus first enunciated the idea, for which De Graaf has the credit, that the testes and the ovaria of birds are homologous organs†, and thence originated the knowledge of the germ cells or vesicles, now familiarly known as the ova of De Graaf, although even in this, the credit of antecedent observation is due to Vesalius‡ and to Fallopius.

It is impossible to read the foregoing pages without feeling a conviction that the Italians were very much in advance of all other nations in their pursuit and knowledge of anatomy during the sixteenth century, and the belief is strengthened by a statistical enquiry, as far as such a scrutiny can be effected at the present day; for, on referring to Portal's "History," we find as many as 111 names of noted men recorded among the Italians; 66 French; 41 German; 24 Spanish; 13

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* Abundant details of the depravity and demoralisation of the fifteeth and sixteenth centuries, from the pope and monarch down to the lowest orders, may be found in the Chroniclers, the Satires of Ariosto, in John Burchard's "Diarium," as well as in Pavinius, Muratori Alamanni, and in Fabre's continuation of Fleury's "Ecclesiastical History." A curious poem, printed about the accession of Henry VIII., gives a graphic picture of the habits and morals of the lower classes of society. It describes the summoning together of persons of all trades and calling to join the "Bote," under one Cock Lorell, a notorious vagabond, and the head of a gang of thieves who infested London. The poem is contained in the Garrick collection, British Museum; the beginning has been destroyed. Wilson's comedy (1550), called "Ralph Roister Doister," also gives a lively picture of London manners among the citizens and gallants of the day.

† De Anatomia Matricis, ch. 341.

‡ De Corporis Humani Fabricâ, lib. v. cap. 15.

English; 7 Dutch; 4 Portuguese; 3 Swiss; 1 Polish: and 1 Danish.

It would be an injustice to the memory of many zealous individuals, who may not have been so accomplished as Vesalius or Cesalpin, but who, nevertheless, instigated their fellow-countrymen to the investigations which they themselves pursued, to their own personal credit and their country's honour, were we to withhold from them the homage which is their due. We now and then hear of Mundinus, as the restorer of anatomy to Italy, and of Charles Etienne as the like benefactor to the French school; but who ever hears of Gonthier in Germany, of Valverda in Spain, of Thomas Vicary in England, of Coitier in Holland, or of Brabus Chamicus in Portugal? yet are they names which should be inscribed in every dissecting room of their respective countries (the workshop for the alleviation of human suffering) as the pioneers of all subsequent anatomists.

CHAP. IX.

PARACELSUS AND PARÉ.

The impulse which the revival of classical literature imparted to medicine was further expanded by the zealous and effective pursuit of anatomy, which has been recorded; for as the mediæval system rested on the speculative hypotheses which the Arabs had introduced, so the practice was made more rational by the labours of the anatomists, whilst the harmonising dogmas of Hippocrates were more easily reestablished in Italy and diffused through France, England, Germany, and Spain in consequence.

The Spaniards, however, true to the nation from whom they derived their greatness, maintained for a time a ridiculous adhesion to the scholastic subtilty of the Arabs, which obtruded itself even into medicine; for one of the physicians of Philip II., Louis Mercado, whom Sprengel has aptly named the Thomas Aquinas of Medicine*, developed the sophistries propounded by Alkhendi, but without any very great display of genius in the management of a bad case.

On the assumption of disease being a subtraction or minus, without any material cause, he jumped from one fallacy to another, dispensing altogether with the form of going through the process which is generally considered to be necessary to arrive at a right conclusion;

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* Sprengel, vol. iii. p. 20.

but by simply answering himself in the negative to the important question, "Whether the indication furnished by a diseased organ is more essential than that deduced from the essence of the disease itself," complacently inferred that a knowledge of disease is useless, seeing that a more potent agent "natura morborum medicatrix" cures. In a subsequent part of his work * he contradicts himself, and exhibits all the specious contortions of the dialectic casuistry.

In Germany, the misty dreams of Paracelsus found a congenial soil, and they were more or less diffused over France and England, to the detriment of a better cause.

Paracelsus, whose career forms a curious chapter in the history of popular delusions, was born A.D. 1493, at Einsiedeln, a small town in the canton of Schwitz, about two miles from Zurich. His father, William Bombast von Hohenheim, was a practitioner of medicine, a calling which should have taught him the importance of learning; but he appears to have paid very little attention to the education of his son, Philippus Aureolus Theophrastus Bombastus von Hohenheim †, who adopted the name of Paracelsus; for Sprengel, imbued with faith in the influence of early education as the source from which tastes, talents, and general character may be traced, satisfied himself that Paracelsus passed his boyhood in acquiring the tricks of conjurors, the jugglery of magicians, and the arts of alchemists, and that, with a smattering of alchemy, astrology, and

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* Ludov. Mercati Opera.

† Laurent Zollweger and Thomas Erastus accuse Paracelsus of having filched the noble name of Hohenheim, his real one being Hæchener; but it is said that his will bears evidence that he was a kinsman of George Boombast von Hohenheim.

chyromancy, he set out, a penniless vagabond, to search the world for such information as suited his particular taste. Much of this he confessed to have acquired from his father, and from some ecclesiastics whom he named, some he wheedled out of quacks, old crones, and gypsies, whilst the scraps of medical knowledge which he possessed he must have picked up in an irregular way at various universities to which his wanderings led him.

He asserted, however, that he was the ornament of the schools wherein he studied, although he does not name them, and spoke of an oath he was obliged to take when he received his medical degree, but he never deigned to say where that degree was taken; nor have the annals of any university revealed the fact. If he ever did attend a university, he must have neglected his studies most wofully, otherwise he could not have been ignorant, as he confessedly was, of the very first elements of the most common kind of knowledge.*

It was the custom of alchemists to travel into many districts in search of information, and this habit Paracelsus adopted to its fullest extent; indeed, he never entirely lost it. He roamed about towns and obscure villages of Spain, Portugal, Hungary, Prussia, Poland, Norway, and Sweden; and even to Constantinople he found his way for the purpose of learning the secret of making the tincture or elixir of Trismegistus, who lived in that capital. This erratic life could leave but little time for study, and he made it a boast that for ten years he never opened a book, an assertion which the catalogue of his library tended to confirm.†

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* History of Chemistry, by T. Thomson, vol. i. p. 142.

† After his death his entire library consisted of a Bible, a Concordance, a New Testament, and the Commentaries of St. Jerome on the Evangelists. Sprengel, vol. iii. p. 290.

On his return from his travels, at the age of thirty-three, he was called to fill the chair of physic and surgery in the university of Basle, on the recommendation of Œcolampadius; and his lectures, written in a confused mixture of German and bad Latin, more like a collection of quack advertisements than the sober lectures of a professor, are still in existence.*

He commenced his career by publicly burning, in the hall of the university, the works of Galen and Avicenna, assuring his auditors that his shoe-ties possessed more medical knowledge than those two physicians, and that all the universities and writers therein combined were less instructed than the hairs of his beard; and that he, who possessed all science direct from God, would be regarded as the monarch of physic. He also wrote a letter to Clauser, a physician at Zurich, wherein he compared himself with Hippocrates, Galen, Rhazes, and Ficinus, each being, in his method of healing, peculiarly fitted to his own respective country, as he was to Germany.

In boasting of the cures which he effected, it was always in disparagement of the Galenists, pretending that he could cure diseases which were pronounced to be incurable by them, and that he had an elixir which would prolong life to an indefinite extent. This tendency to gasconade is not, after all, so bad a feature in a man, as, at first sight, it may appear; for he takes on himself obligations which he is morally bound to redeem, or to appear very ridiculous; so, undoubtedly, he often did. Notwithstanding this, his mountebank air, and confident bearing, gave a semblance of truthfulness to his vain-glorious pretensions, whilst the novelty, or, rather, the ambiguity of his doctrine, and his assumed power of curing the most inveterate diseases, as well as of indefinitely prolonging life, attracted crowds of victims.

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* Thomson's Hist. of Chemistry, vol. i. p. 144.

He falsely asserted that he had restored Frobenius, a celebrated printer of Basle, from a grave distemper, although it was said that he had killed him by his remedies. At all events, he died; and Erasmus, who heard only the first version, consulted him relative to his own sufferings, but very quickly discovered that he had to do with an impudent and presumptuous quack. So also did his pupils; for scarcely had a year elapsed when his lectures were deserted, and it was generally felt that his swaggering empiricism was made a cloak for the most insufferable ignorance. Ramus said of him that the coarseness of his language was well suited to the vulgarity of the age, and that his arrogance and boasting were considered, as usual, a proof of superior merit.

No person has ever attempted to show that the reputation of Paracelsus was founded on any actual discovery*, but the occasion of his fame appears to have been the importance which he attached to the chemistry of his remedies; and this, in Germany, where alchemy was in the ascendency, naturally gained him many proselytes.

"Upon this real advantage," says Mr. Hallam, "he founded those extravagant theories which attracted many ardent minds in the sixteenth century, and were afterwards woven into new schemes of fanciful philosophy. His own models were the reveries of Cabbala, and the theosophy of the mystics. He seized hold of a notion which easily seduces the imagination of those who do not ask for rational proof, that there is a constant analogy between the macrocosm, as they call it, of external nature, and microcosm of man. This harmony and parallelism of all things, he maintains, can only be made known to us by divine revelation; and hence all the heathen philosophy has been erroneous. The key to the knowledge of nature is in the Scriptures only, studied by means of the Spirit of God communicating an interior light to the contemplative soul." Here is rhapsody from a drunken sot, who, as Operinus informs us, seldom or ever lectured and never dictated to those who put his obscure thoughts into Latin, which he was unable to do himself, until he was half inebriated.*

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* Gmelin, in his "Handbook of Chemistry," states that it was Paracelsus who first mentioned the metal zinc; and carbonic acid gas, as evolved from fermentation, or the burning of lime, is also associated by Gmelin with the name of Paracelsus.

No one has ever succeeded in forming a perfectly clear and concise idea of the opinions of Paracelsus: probably he could not have defined them himself; for his statements were so constantly at variance with each other as to justify the assertion of Erastus, that he never advanced an opinion in one place without belying it in another. Some have supposed that his obscure language was used designedly to conceal his thoughts, seeing that instead of adhering to the common signification of words, he used common words to which he applied new significations; thus, the word anatomy, to which is generally attached the idea of dissecting animals to determine their structure, he used to express the nature, force, and magical designation of a thing.*

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* Sprengel, vol. iii. p. 292. Operinus was a printer at Basle, to whom Paracelsus always promised to reveal the secret of making the philosopher's stone, and, for a long time, Don Quixote and Sancho Panza expressed the nature of the relationship between them; but, when Paracelsus failed in his promise, Operinus reviled him with so much bitterness that we ought not perhaps to place implicit faith in him.

The fundamental doctrine of his chemistry consists in the determination that all bodies are composed of three elements, salt, sulphur, and mercury, instead of the four suggested by Hippocrates†, and herein Dr. Whewell is disposed to see a real advance in chemical theory, and an acknowledgment of changes produced by the operations of chemistry‡; but we have ample proof of the existence of retorts and other apparatus long before the time of Paracelsus; and although we may readily admit that new medicines were obtained by his manipulations, it is but fair to his predecessor, Basil Valentine, to affirm that he it was who originated the doctrine of three elements, and that Paracelsus borrowed it from him.§

With respect to his knowledge of anatomy and rational physiology, it may be confidently asserted that he was destitute of any clear and methodical views on those subjects; notwithstanding which he did not hesitate to impugn the opinions of the ancients, and substituted a vague hypothesis concerning the stars, "which he regarded as the source of all knowledge and as pervading and influencing all things."‖ He thought that man had a sidereal as well as material body, and that the former part survived the latter for some considerable time, thus explaining the apparition of dead persons, in which he firmly believed. This starry influence he connected with each corporeal element, assigning to the sidereal salt the material consistence of the body, to the sidereal sulphur its growth and animal heat, and to the sidereal mercury the conservation of the fluids[*]: in short, he maintained the animation of everything and something more; for, besides all visible nature, he peopled the world with spiritual beings, inhabitants of the four elements, subject to disease and death like man. These are silvains (sylphs), undines, or nymphs, gnomes, and salamanders. It is thus observable, that he first gave these names which rendered afterwards the Rosicrucian fables so celebrated.[†] Another portion of his physiological doctrine was his imaginary *archæus* or demon, whose especial object it was to preside in the stomach, for the purpose of separating the poisonous from the nutritious part of the food, and of directing each into its proper course.[‡]

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* Thomson's History of Chemistry, vol. i. p. 151; see also Sprengel, vol. iii. p. 296.

† Paracelsus (A. P. T.), Opera Medico-chemica sine Paradoxa, sect. Chymica, præparationes spagiricæ, alchymia, &c.

‡ Whewell's History of the Inductive Sciences, vol. iii. p. 96.

§ Rees's Encyclopædia, art. "Paracelsus."

‖ Sprengel, vol. iii. p. 306.

For a theory of disease he invoked the power of chemical operations as induced by certain entities, to each of which he attributed certain forms of distempers; the *ens astrorum*, influencing the air; the *ens veneni*, the flood; the *ens naturale*, all other natural things; whilst the *ens spirituale*, and *ens deale*, he regarded as affecting the sidereal body both in its present and future condition; each producing either the effervescence of the salt, the combustion of the sulphur, or the coagulation of the mercury.[§] The only other portion of his pathology which it will be necessary to notice is that which concerns his theory of tartar, as he denominated it from its tendency to burn like the fire of hell. Sprengel considered this to be the most useful innovation of Paracelsus, who regarded it as the principle of all diseases which result from the thickening of the humours, the rigidity of the solids, or the accumulation of calcareous matter. It was in effect the first time it was spoken of as a product of vital chemistry, although it had been noticed before, and most undoubtedly constituted the *atrabilia* of Galen.

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[*] Sprengel, vol. iii. p. 311.

[†] Hallam, vol. i. p. 398.

[‡] Sprengel, vol. iii. p. 312, from the Greek ἀρχὴ (principle).

[§] Ibid. vol. iii. pp. 314–316.

After a disgraceful quarrel with the magistrates of Basle, on account of a decision against him in respect to a demand of fees from the canon Cornelius of Lichtenfels, which was deemed exorbitant, in a fit of wrath he suddenly quitted the place, and betook himself to his former vagrant life, during which he frequently varied his usual custom of sleeping in his clothes by passing whole nights in low taverns, drinking with boors as sottish as himself. But, in spite of these irregularities, he maintained his reputation by cures which were then regarded as wonderful; his failures, however, were equally conspicuous; and the most signal of all occurred in his own person; for, after professing to have the power of prolonging human life beyond the ordinary limit, he died in one of his familiar haunts, an inn at Saltzburg, in his forty-eighth year.*

Few men have been judged of so differently as Paracelsus; nor is it possible to estimate him correctly, unless we take into account the dominant spirit of the age in which he lived. It was essentially superstitious, and therefore gave ready acceptance to any tale of wonder or clever imposture.

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* Rees's Encyclopædia.

The end and aim of his teaching and writing was to popularise mystification, and unite it with medicine for the purpose of gaining the suffrage of the uneducated classes. And therein he succeeded, as Gonthier, who was initiated into the dogmas of his system, clearly states.* But he had also the sagacity to perceive the importance which a knowledge of chemistry was likely to be to the physician, and sought to draw that branch of natural science out of the obscurity in which it still lurked. Therein also he succeeded to a great degree; for after his time, as we shall presently see, chemistry was cultivated by physicians generally. Hence Thomson speaks of him as having shaken the medical throne of Galen and Avicenna to its very foundation, and raised a new system of medicine in its stead. He did so far effect a reformation, and his medical skill mainly consisted in boldly administering powerful remedies, which were very imperfectly understood; his favourite ones being opium, antimony, and mercury. The latter, as we have seen, he was the first to give as a remedy for that terrible disease which the companions of Columbus introduced into Europe; and therein again he conferred a great benefit on mankind; but, as Sprengel has observed†, the following circumstances opposed themselves to a favourable reception of his doctrines by scientific men.

1st. Medicine is a science, and to possess it it must be learned. It is founded on rational principles, and deduced from experience, consequently any dogmas which represent experience as useless and reject the testimony of reason cannot be accepted by scientific physicians.

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* "Maluit vulgo potius quam probis viris inservire. Gonthier de Medicinâ vetere et novâ."—*Dial.* xi. p. 30.

† Vol. iii. pp. 333, 334.

2nd. The system of Paracelsus was founded on mysticism and fanaticism of the grossest kind; and although superstition reigned supreme in the sixteenth century, any attempt to clothe it in the garb of a scientific doctrine was too great an appeal to reason or common sense to admit of success.

3rd. Paracelsus was not the man to succeed, even if it had been possible; for he despised all science, because science was a stranger to him. And although he spoke of divine inspiration as a source of knowledge, his life gave the lie to his assumption of it.

He boasted that he had never learned anything from professedly scientific men, but that he had picked up all his knowledge from old women, mountebanks, and magicians; he mendaciously vaunted his own powers, and lost no opportunity of scoffing at others; consequently, whatever his natural talent might be, he placed himself in the same category with those of the same nature, who have ever been ready to purchase this world's riches at the ruinous price of character and reputation. And there are men at the present day acting on principles not the less odious, because they attempt to cloak the vile nature of their nefarious transactions in the garb of an assumed superiority, nor the less dangerous, because they bear about with them a travestied resemblance to men who are the ornaments of that noble profession on which they seek to bring disgrace.

But let us turn to a more pleasing picture: the representation of a man whose ambition it was to devote a life of more than ordinary duration to the pursuit of his calling, with a sincere and independent spirit for the discovery and propagation of truth, to his own personal honour and the good of his fellow-creatures.

Ambroise Paré was born about the beginning of the sixteenth century, at Laval in the province of Maine. His father was poor, so that, like Paracelsus, he had little attention given to his education, the sum paid to a chaplain, named Orsoy, being so very inadequate that the poor boy was made to groom a mule and work in a garden to make up for the deficiency. Unlike his contemporary, however, he was no sooner placed with a practitioner named Vialot, in his native town, than he was inspired with a love of the medical art, and lost no opportunity of acquiring knowledge. During his pupilage the lithotomist, Laurent Colot, was sent for to operate on a friend of the chaplain, when Paré assisted, and this appears to have determined his preference for surgery.*

On proceeding to Paris to attend lectures, which were chiefly explanations of the works of Guy de Chauliac and of Lanfranc, he soon acquired sufficient knowledge of anatomy to teach it; and he was also employed by Jacques Goupil, from whom he acquired the art of dressing wounds. In 1536 he followed the Sieur Réné, a colonel of infantry, to Italy, where he availed himself of every opportunity which occurred of practising such operations on the living subject as he had prepared himself for on the dead. Thus he turned his travelling to better account than did Paracelsus; for it is reported of him that he acquired so much esteem that his mere presence in a besieged town was enough to reanimate the troops employed for its defence.† On his return from Italy, like Paracelsus, he was called to fill the chair of surgery, in the College of Saint Edme; wherein, enlightened by the principles which he had acquired in practice, his lectures became so popular and his fame so great, that he was elected surgeon in ordinary to Henry II. Instead of vain boasting, however, like the Professor of Basle, Paré aspired only to transmit his name to posterity as a good and great man, and this was the guiding principle of every action of his life.*

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* Biographie Universelle, art. "Paré."

† Ibid.

He was next appointed surgeon to Francis II. whose sudden death from inflammation and suppuration of the ear†, gave an opportunity, which the rivals of Paré, who were jealous of his fame, seized on to utter dastardly suspicions of foul play, and even hinted that he had caused the king's death by injecting poison into his ear. When the queen-mother, Catherine de Medicis, heard of the rumour, she immediately exclaimed, "Non, non, Ambroise est trop homme de bien et notre bon ami pour avoir eu la pensée de ce projet odieux."‡ Although a Protestant, Paré was consulted by the most intolerant Catholics in case of need, though it is said that the Marquise de Boissières died bravely rather than owe her life to a Huguenot.§

Charles IX., however, whom Paré had cured of a painful disease of the arm occasioned by unskilful bleeding, retained him as his chief surgeon, and if we may believe the chronicler Petitot, cherished him as an intimate friend; so much so that before the massacre of Saint Bartholomew, when Charles hinted to Ambroise that it was then time to become Catholic, and Paré reminded him of a promise that he would never command a thing wherein he could not obey, Charles locked him up in the royal chamber, saying, "Il n'est pas à propos d'advancer la mort d'un homme qui peut conserver un monde entier." In thus saving him a less selfish motive than that which the above record would imply, influenced the king; for many a Huguenot whose services were as valuable was murdered on that occasion.

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* Riolan puts into the mouth of Paré the aspiration of Horace: "Non omnis moriar, multaque pars mei vitabit Libitinam."

† That the disease from which Francis died was as above stated may be inferred with tolerable certainty from the disorganisation of the internal ear, and the rupture of the abscess under the dura-mater. See Histoire de France, par M. Petit, p. 212.

‡ Biographie Universelle, art. "Paré."

§ Chronique de Charles IX., par Prosper Mérimée.

After the death of Charles, Paré was appointed surgeon to Henry III., so that he enjoyed the highest honours which could possibly fall to the lot of a man in his station, until his own death, which occurred at a very advanced age, about the year 1590. Ambroise Paré has been called the Father of French Surgery, and his writings, which are remarkable for the variety and number of new facts they contain, and distinguished from all others of his time by an absence of superstitious veneration of the ancients, seem to justify the appellation.*

Freed from the yoke of authority and possessing the noble qualities of energy and intellect, he submitted everything to the test of observation. Like Jean de

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* Although Ambroise Paré opposed the arch impostor, Paracelsus, yet it must be acknowledged that he was not entirely exempt from the prejudices of his day; for, with Erastus, he believed in demoniacs, and thought that the evil spirits manifested themselves by disordering the imagination, just as clouds assume their thousand and one shapes in the atmosphere, but modestly admitted his inability to explain the phenomenon more clearly than he could explain why iron was attracted by the magnet. See Sprengel, vol. iii. p. 241.

Vigo, he imagined that gun-shot wounds were, by their nature, poisonous, wherefore he treated them with boiling oil; but, having failed on one occasion to apply the usual remedy, he found, to his surprise, that his neglected patients were better and freer from fever on the following day than those who had had the boiling oil applied, and that their wounds healed quicker; whereupon he renounced the ordinary practice, and from that time such wounds have received a more rational treatment.

He also renewed the use of ligatures to arteries for the purpose of arresting hæmorrhage, which ligatures many people believe he first introduced; but he does not claim the discovery as his own, neither does Portal accord it to him; on the contrary, the latter points to a passage in the writings of Albucasis, which refers to the ligature as one means of stopping the flow of blood, and thinks it probable that the Italian surgeons continued its application until Ambroise Paré first saw it used in Italy. When he introduced it into his own country, the French Faculty of Medicine ridiculed it as a system of hanging life upon a thread, seeing that boiling pitch had stood the test of so many centuries. He did not extend the use of the ligature to the cure of aneurisms; nor is the omission to be wondered at, when we consider that the nature of the disease and the functions of the arteries were then so imperfectly understood.

But he did originate new and important ideas for the relief of many diseases and accidents, which have been followed with the happiest results. His precepts, for instance, as to the best mode of making an opening into the chest to create an artificial outlet for the discharge of matter which sometimes follows pleurisy, are most judicious, and, although it must be confessed that the results of this particular operation have not been very encouraging, yet, in some few cases temporary relief and even complete recovery have followed. His observations on the reduction of hernia, and on the operation in cases not admitting of reduction, are wonderfully perfect for the time at which they were written. His remarks on wounds of the head and fractures of the cranium, together with his suggestions for the application of the trephine, were original and most valuable in practice. He distinguished fracture of the neck of the thigh-bone from the dislocation of the head of that bone, with which it had previously been confounded. In short, it may be truthfully affirmed that the works of Ambroise Paré guided the labours of surgeons into that course to which their art owes so much of its modern perfection.

It is not intended here, by any exaggerated account, to attribute to Paré more excellence than admits of proof; nor, in speaking of the comparative merits of the two individuals whose lives we have been considering, has it been attempted to supply the place of facts by crude and inconsiderate allegations; but after an impartial consideration of circumstances, fairly narrated and with due allowance made for the period in which they occurred, it must be admitted, that both were born under somewhat similar conditions, with aptitudes in each which may be called a genius for the profession, yet that one flew off into an eccentric orb of quackery and planetary agency, which all right thinking men admit to be delusions now, whilst the other confined himself to the acquisition of useful and practical knowledge, and so indirectly realised what Charles said concerning him.

It would be well if the contrast ended here; but the great mischief of quackery is the perpetuation of its errors. We have abundant evidence to make it manifest, that orthodox medicine comes stronger out of every contest; were it not so there would be reason to doubt the truth of its principles; but in the mean time charlatans do much dishonour and injury to the art by which they are unworthily enriched; for at them it is that scoffers direct their shafts, imagining with the world at large, that they have found the weak side of medicine, whilst they have only found detractors like themselves.

The most celebrated pupil of Paracelsus was Leonhard Thurneysser-zum-Thurn, the son of a goldsmith at Basle, who, at an early age, gave assurance of his faculty to stifle the voice of conscience by gilding a mass of tin and attempting to sell it as gold. He next directed his attention to medicine, and showed himself worthy of his master by making still larger demands on the credulity of his neighbours. He made false representations of cosmetics and remedies, which he sold at exorbitant prices under the pompous and illusory titles of tincture of gold, magistery of the sun, &c., but his extravagant charlatanism was so transparent that both it and his ignorance were quickly exposed by Gaspard Hoffman of Frankfort; so that his fame was but of short duration. Not so, however, his sportive eccentricities, which he carried on with so light and jaunty a carelessness as to excite many persons to become his admirers. Some there were, more especially in Germany, who regarded Paracelsus as the only true physician*, and by adopting his opinions, led the way to all sorts of absurdities, of which the developement of the Rosicrucians was the climax.

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* The following individuals were celebrated partizans of Paracelsus: Adam Bodenstein, Michael Toxites of Grabundten, Valen-

On the other hand, the men who followed and emulated Paré were such as Pigray, his pupil and friend, whose elegant and graceful style of writing caused it to be said of him, "Nihil tetigit quod non ornavit," whilst his modest demeanour in the investigation of the province and limits of knowledge was consistent with the doubt which he first put into words, that in the most successful and brilliant achievement in medicine we cannot be perfectly certain that the cure may not be more attributable to the efforts of nature than to the appliances of art.

We might add the names of many others who, like him, have originated discoveries which have contributed to elevate the profession to what it now is.*

The unfortunate feuds which have been noticed between the faculty of medicine and the surgeons of Paris, were again renewed in the year 1551 by Duhamel, who was then Dean of the Faculty. Like Hélin, he ventured to contest the privileges of the surgeons, and succeeded in revoking the decree of the university made in 1515.

By this proceeding the surgeons were again obliged to submit to an examination before the Faculty of Medi-

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tine Anteprassus Siloranus, Gerard Dorn, and last, though not least, Pierre Severin of Jutland, who professed to be able to cure epilepsy, gout, and lepra, but of whom Paludanus said that he never gave any proof of such power.

* The following individuals, who trod in the steps of Paré and Pigray, may be cited, viz. Jacque de Marque, Germain Colot, Philip Colot, Severin Pineau, and many others, whose names have been mentioned in connexion with discoveries in anatomy.

cine; but in 1577 Henry III. restored to them their power of conferring academic honours; and in spite of another attempt like that of Duhamel's their rights have been maintained, and confirmed by Henry IV. and Louis XIII.[*]

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[*] Sprengel, vol. iii. p. 396.

CHAP. X.

INFLUENCE OF THE PHILOSOPHY OF RAMUS ON MEDICINE.—DELUSIONS OF THE SIXTEENTH CENTURY.

It must be borne in mind, that all the circumstances which have been recorded as occurring at the beginning of the sixteenth century were nearly contemporaneous; and we should also remember that influences, whether good or bad, were not so readily diffused then as they have been since. There was no postal system, the institution of which must have made almost as great a revolution in society as the railroads and electric telegraph have done in our own time; nor was there then a periodical press to circulate the impulses of literature and science through the framework of the world at large.

From such considerations we can imagine how it was that one creed may have been reiterated day after day by the side of another, just as the dogmas of the schoolmen and Saracens were proclaimed at the same time, and well nigh in the same places, with those of the ancient Greeks, as revived by the Humanists. We can understand too what is meant by the resistance of that age as compared with the progress of the present, when it is simply madness, even in monarchs, to shroud themselves in the false belief that their own individual interests are opposed to, or even distinct from, the general advancement in social welfare.

The very first step towards a community in thought and opinion, which was made by the establishment of schools and universities, extended the influence which one individual might have obtained in the circle immediately around him to the larger influence of a body of individuals upon the public mind; and that has obviously increased with the increasing facilities of intercommunication. The spirit of enquiry which originated with the Humanists, having once begun to loosen the fetters of the mind, common sense very soon asserted its prerogative over the system of scholastic mystification, although it failed to lay bare many other frauds which were practised on human credulity.

This time, the boon came from a poor shepherd, whose innate thirst for knowledge induced him to forsake his indigent parents for the purpose of gleaning in Paris, as he best could, the elements of that philosophy which, at the very onset of his career, he wielded against the prejudices of his day. Pierre de la Ramée, or Ramus, as he is generally called, on presenting himself for his degree of Master of Arts in 1536, chose for the subject of his thesis the startling paradox, "Quæcumque ab Aristotele dicta esse, commentitia esse" (All that has been affirmed by Aristotle is a fabrication), a proposition then so astounding that it is said to have placed his judges in the greatest embarrassment. It was so well sustained, however, that his system very soon acquired considerable repute; and when, in his twenty-eighth year, he published his "Aristotelicæ Animadversiones," he himself became equally celebrated by the incredible persecutions of which he was made the object.*

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* Encyclopædia Britannica, art. "Ramus."

Having been appointed professor of philosophy, he became a Protestant, and quickly manifested principles and opinions at variance with those of his colleagues. But his greatest admirers, admitting the independence of his spirit, the sagacity of his criticisms, and the truth of his foresight, have reproached him for a certain amount of folly in not anticipating the resistance to all innovation on received opinions, by beginning his opposition to it too soon, and by desiring to carry his reformation too far.* He fell a victim to his religious faith in company with Ferriens, who was a celebrated advocate, Loménie, Secretary of State, and La Place, the historian, in the general massacre of Saint Bartholomew †.

In the "Archives Curieuses de l'Histoire de France," Ramus points out the defects, and proposes reforms in the system of university education. He speaks of medicine and theology as of one faculty, but comments on the different systems of teaching the two, to the disparagement of the latter. "The reason," said he, "why medicine is better taught, and the lectures better attended than in theology is, that those who teach it know it, and practise it, and their disputations are chiefly on the books of Hippocrates and Galen; whilst the theologians observe a strict reticence on questions of the Old Testament, which they read in Hebrew, as well as of the New, which they read in Greek; but display their learning in subtle questions respecting the pagan philosophy of Plato and Aristotle."[*] But notwithstanding the homage he pays to the method of instruction adopted by Silvius and Goulip, whose names he quotes, the great end and aim of Ramus was to extend his contemplated reformation throughout the entire faculty of physic, to withdraw the minds of both professors and students from the authoritative dogmas of the ancients, and to direct them to those of nature and truth. Seeing, however, how much there is of uncertainty about the sources and materials of history, when events are passing even under our own eyes, it behoves us to temper our assurance with some degree of misgiving, and to draw our inferences with moderation when speaking of the past. Still, in contemplating this very interesting period of time, and tracing, as far as we are able, the transition from one phase of scientific opinion to another, it does appear that the philosophy of Ramus had a marked effect on the spirit of the age, and, in some degree, not only amplified, but modified also the impulse which the Humanists originated. Ramus promulgated his opinions just before Vesalius refused his absolute assent to the doctrines of the ancients, and they became popular simultaneously with the dawn of that turbulent epoch, when medicine was deluged with innumerable new facts and new theories.

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* Archives Curieuses de l'Histoire de France depuis Louis XI. jusqu'à Louis XVIII., par L. Cimber et F. Danjou, 1er série, tom. v. p. 117.

† Histoire des Français, par J. S. L. Simonde de Sismondi, tom. xix. p. 174.

The method of studying causes which Ramus adopted, was applied by Fernel to the production of disease. He first published a Cosmotheoria, wherein he attempted to give the precise length of a degree of the meridian, and signally failed[†]; but he was better versed in medical literature, and was a follower of Hippocrates and Aristotle. He never hesitated, however, to join issue with them when he found them to be in error, or when he suspected them to be so, as the physiological and pathological parts of his writings show. His voluminous work* is a proof of the industry and zeal with which he wrote; and by a happy combination of independent mind with due deference to the opinions of the Greeks, he propagated that liberty of expression in others which entitles him to be ranked as a medical reformer himself.† Whilst Ramus assaulted the syllogistic stronghold of Aristotelian despotism, Argentier invaded the physical department of that empire, and contributed much to free men's minds from the superstitious veneration of all that was inconsistent with reason and experience in the theories of the ancients.

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[*] Archives Curieuses, &c. Avertissement sur la Reformation de l'Université, par P. Ramus.

[†] Philosophical Magazine for Dec. 1841.

John Argentier, a contemporary of Sylvius, was born at Quiers, in Piedmont, in 1513. After studying at Turin, he practised at Lyons, where he settled in 1539, but subsequently went to Antwerp. He was next appointed professor at Pisa, and finally at Naples, where he died in 1572.

He opposed himself not only to the authority of Aristotle, but to that of Galen also, against whose dogmas his charges were mainly directed. He had the character of being an unsuccessful practitioner, as his migratory propensities would tend to prove; nevertheless he availed himself of the advances which were being made in the knowledge of anatomy to repudiate many of the most important theories which Galen had propounded. Thus, with great acumen, he showed that the secondary qualities of animal tissues were not dependent on the primary elements, nor the functions of organs on the multiplicity of animal spirits; but that one vital force directed and animated all; and that consequently the different powers of the soul were not inherent in separate portions of the brain, as Galen had supposed. He combated the notion of the liver being the organ of sanguification and the origin of the veins, by the cogent argument that the veins are formed before the liver; and hence he inferred that the blood was formed in the veins. To this habit of substituting one vague hypothesis for another, he owed much of the opposition which he encountered from many of his contemporaries; but his subtle arguments served to break through the boundaries of prejudice, which for centuries had hedged in the human intellect, and he was supported in his views by the two celebrated professors, Rondelet and Joubert of Montpellier.

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* "Johannis Fernelii, Ambiani Galliarum Archiatri Universæ Medicina." The entire works of Fernel were collected and published by André Wechel, printer to the University of Paris, in 1567, and in 1580 a magnificent edition was published in Geneva. The first part treats of physiology, the second of pathology, the third of prognosis, the fourth of therapeutics, and the fifth of occult causes. Altogether it is one of the most remarkable works of the sixteenth century.

† Sprengel, vol. iii. p. 24.

The former of these, though not eminent as a successful practitioner, was celebrated for his devotion to the study of natural history, and for some discoveries which he made in anatomy. He gave the first clear description of the vesiculæ seminales, but Portal * supposes that they were known before. Those folds of membrane, however, which are placed between the small and large intestines †, and which act as valves,

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* Portal, vol. i. p. 522.

† The ilio-cæcal and ilio-colic valves.

were undoubtedly first described by Rondelet. Joubert was his pupil, and succeeded him in the chair of anatomy in 1596. In 1573 he was made Chancellor of the University. His treatise on "Popular Errors,"* dedicated to Duke Albert and his wife, Elizabeth of Belgium, is both interesting and instructive, as showing that the abuses to which the profession is liable are not peculiar to this or that age, but to all time, and that its best interests are most effectually served by a practical disregard of them. Owing to some misapprehension, the treatise in question has been described as licentious†, and unfit for the patronage of Margaret of Navarre, to whom it was erroneously said to be dedicated: still it obtained for its author great celebrity. The authority which Argentier achieved in theory, Botal of Asti, in Piedmont‡, accomplished in the practice of medicine, the course of which he completely changed by a freedom of bleeding beyond any which had been adopted before him. In either sex, both young and old, and in all diseases, whether low in type or acute in character, he advocated large and repeated bleeding. The young he bled freely on account of the rapid reproduction of blood in youth; the old, because he saw in the practice a conduciveness to rejuvenescence. He bled freely in low and wasting diseases, even of a malignant nature, because a richer and better blood was formed; in dysentery, because he recognised in it an affinity to inflammation of the lungs, in which all physicians bled;

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* "Erreurs populaires au fait de la Médecine et Régime de Santé." It was first published in Latin, and entitled: "De vulgi Erroribus medicinæ medicorumque dignitatem deformantibus." (Joubert Laurentius.)

† Biographie Universelle, art. "Joubert."

‡ Botal was a pupil of Lanfranc, Trincavella, and Fallopius.

in all forms of flatulency, because of its power to relieve obstructions; in short he had a reason for bleeding in every special distemper; and when reproached for the indiscriminate routine of practice, he argued that the more water you draw from a well the purer and better is that which filters in. From him originated the system of bleeding in pregnancy, which is continued to this day.

This theory of Botal was the means of directing the attention of medical practitioners to the effects of blood-letting, and it engendered, perhaps, undue circumspection in those who were averse to it; but the fashion which had existed in Spain since the time of Brissot, and which was now again recommended by the experience of Valdes * of Seville, who taught his art in his own native town, by Vega of Alcala †, and by Caranès of Barcelona, very soon extended itself over France, where Paré adopted it, and founded his practice on Brissot's doctrine of derivation. According to Mazzuchelli, it was also favourably received in Italy, although in all these countries it gave rise to considerable controversy.

Numerous medical writers, doubtless with the feeling that every system has a substratum of truth, made it an object to reconcile, as far as they were able, the discrepancies which were found to exist between the Greeks and Arabians; for the Saracenic school, although it rapidly lost ground, preserved an ascendency in Spain, and a certain influence in France and Italy, until it was generally felt that its principles were antagonistic to those of the Greeks.‡ Nevertheless, unwilling to re-

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* Valdes (Ferdinand de), De Utilitate Venæsectiones in Variolis atque aliis affectibus Puerorum. 1583.

† Vega (Christopher), Comm. in Galenum de Sanguinis missione.

‡ One marked trace of the lingering influence of the Arabian

linquish the advantages which the numerous appliances of the latter appeared to promise, encumbered as they were with vague hypotheses, and at the same time, desirous of embracing the principles of the Greeks, which harmonised so entirely with common sense, they selected a middle course, and received in consequence the name of conciliators.*

Sylvaticus was one who vindicated the right of reason combined with experience, and contended that the two united required a careful study of the ancients to develope all that human art could attain to. His views were so rational that it would be unfair towards him to withhold his own words. "I am not," says he, "of the number of those who pretend to follow exclusively the principles of the Greeks and other physicians of antiquity; for I well know that the moderns have made many precious discoveries for science and useful to the happiness of mankind: I use most willingly the latter when circumstances require; but I do not the less persist in thinking that, in an art such as ours is, every invasion is dangerous, and that we ought not to neglect, without great circumspection, that which the ancients have taught us with so much clearness and precision."†

Nicolaus Rorarius, also a conciliator, took great pains to explain the differences which were observed in the opinions of the ancient Greeks‡, and succeeded to a certain degree; but it was at the expense of his better

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school, which was observed over the greater part of Europe, was the precarious empiricism of judging diseases by the renal secretion, without seeing the patient; this was very general in the sixteenth century. Hallam, Lit. Hist. i. 466.

* Sprengel, vol. iii. p. 36.

† Ibid. vol. iii. pp. 29, 30.

‡ Rorarius (Nicolaus), Contradictiones, Dubia, et Paradoxa in libros Hippocratis, Celsi, Galeni, &c., cum corundem conciliationibus.

judgment. He attempted the same amiable service towards the Saracens; but as he was more learned in Greek than in Arabic, his leaning was manifestly towards the Greeks. So likewise another conciliator, Franciscus Vallesius, whose erudition lay chiefly in the school of rhetoric, allowed his approbation to turn with his bias towards the dazzling fence of the Scholastics*; but, as might have been expected, the very act of resuscitating questions, many of which were fast sinking into oblivion, caused them to be discussed with greater warmth and energy than ever. At no time did the disputes between the Revulsionists and Derivativists run higher or wax warmer than when the Conciliators entered the field as mediators, especially when the doctrine of Botal, the Sangrado of the day, came to be superadded as an element of discord; and Sylvaticus was not the least eloquent in denouncing the folly of bleeding in putrid fevers. Paré, as we have seen, took up the cudgels in defence of Brissot: and, as his writings were not less celebrated for the number and variety of facts they contain than for the unbiassed manner in which he reasoned on them, he was no mean ally.†

These men, in common with Ramus, Argentier, and Botal, threw off the despotic yoke of ancient prejudices, encouraged the investigation and criticism of dominant opinions, and protested against dogmatism in every shape; so that a spirit of free enquiry was engendered, and many an ardent mind was inspired with a daring confidence, such as beguiled poor Servetus onward to his untimely end. But it was the most natural thing in the world that it should be so; for intellect, which had so long been pent up and stifled under the superstitions of the Arabs and the theocracy of Christendom, was sure to burst into life and activity in some form or other; and the foregoing pages have clearly shown how it did so in relation to medicine. As a skilful writer has lately remarked, "Active minds cannot remain at rest. In a cultivated age they are too often contented to move on in the beaten path. But where no path exists they will make one."*

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* Controversiæ Medicæ et Philosophiæ. Vallesius Franciscus.

† An old fallacy was revived about this time by Langius, who joined in the above dispute, showing that if a female be bled from a vein behind the ear, she is thereby rendered sterile; but instead of ascertaining, by experiment, whether it really was so, he entered into an elaborate discourse of hypothetical reasoning.

Fanaticism was one form in which it broke out; but fanaticism is not so great an evil as it may have appeared, when we contemplated it abstractedly; for now that we are in a position to take a more comprehensive view of the middle ages, when the church and Arabic rule reigned supreme, the influence of the double religious domination may be perceived at the bottom of every social institution, and in each may we see and feel how men's minds were roused from a state of utter torpor into one of pure fanaticism. The reverse of the medal was, undoubtedly, the superstition stamped on it; but with it scholastic philosophy gained currency also. Religious zeal, therefore, was a powerful principle then, as it ever has been, in influencing the characters of men; and it is according to the view we take of the ambiguous aspect which the mediæval epoch presents, that we must feel towards it. One thing is quite clear; there is no middle term to express that feeling: either we must revile it or praise it; we cannot feel indifferent towards it. Those who hate it look on it as the enemy of every liberty and improvement; yet admit that it was characterised by force and grandeur, and that it was the heroic age of Christendom; whilst those who praise it, do not deny that it was corrupt and rapacious; but the evils, say they, were more than counterbalanced by good, seeing that, by the side of every iniquity there was an expiation, by the side of every misery an asylum, and by the side of every scourge an appeal for resistance.* Its greatest detractors do not look upon it as utterly bad, nor its greatest admirers as absolutely good. It undoubtedly favoured the spread of universities, and by them has the science of medicine been greatly advanced. But, whilst we must acknowledge the influence of the mediæval ages and the incitements to learning which grew out of them, we cannot fail to see that the spirit which most opposed itself to the dominant theocracy was just that which most advanced medicine towards the rank of an inductive science. It would simply be weakening the statement by quoting this or that instance; for the names and circumstances which have been adduced in these pages have made it apparent that such was the fact throughout Europe.

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* Miscellaneous Writings, by Lord Macaulay, vol. i. p. 53.

But the influence of the mediæval ages did not confine itself to orthodox medicine, for the alchemy of Geber, with the casuistry of the schoolmen, impressed a complexion on empiricism, which brought into existence such men as Paracelsus and Thurneyssen, just as the revival of classical literature and the discoveries of anatomists called into being such men as Paré and Pigray.

This proposition may be more satisfactorily elucidated by an investigation of the title on which orthodox medicine assumes to itself the supremacy over every other system; when it will be seen that it has, in every age, flourished most, and still most flourishes where there has been, and where there still is, a generous rivalry. But empiricism, that parasitical growth of the profession, suffers under similar circumstances; and well might it have been quoted by Mr. Darwin as collateral evidence to illustrate his theory of variation in cases of dependency of one organic being on another, as of a parasite on its prey.* Medicine presents a vast field for culture, and as in nature we find a noxious weed increasing in number and size when some advantage is given to it over its more useful competitors for life, so quackery, having once taken root, usurps the right of succession for a time, and in the space which would be far more profitably occupied by another plant. In both cases, the external conditions of life being favourable, new modifications or correlations of growth ensue.

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* Le Correspondant for May, 1860.

But let us clearly understand what we mean by the term charlatan, before we proceed further, lest, by giving too indefinite an interpretation to the word, we may be caught straying from absolute truth.

Any man, then, who deceives the public by false or exaggerated promises of some good to them, solely with a view to his own profit, is a charlatan. Many practitioners of the most unimpeachable integrity are sometimes driven to use an artifice for the sole benefit of their patients; but in so doing they cannot be said to be charlatans, for they do not fulfil the most debasing condition necessary to constitute the character.

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* On the Origin of Species by means of Natural Selection, by Charles Darwin, M.A. p. 75.

Now it will not, I presume, be disputed by the most imaginative persons, that oracular divinations, as practised by the ancient Greeks and Romans, were systematic impostures on credulous people; and a simple enumeration of the various forms of augury which were then used, gives force to the conviction that they were neither more nor less than pure deceptions *; but illusions which were perfectly consistent with the national habits of thought and ceremonial in their public temples. Besides these oracles, there were different kinds of irregular practitioners, whose very designations testify to their number, and show that both Greece and Rome were inundated with them.†

We have seen how congenial were the professions of supernatural power, and the miraculous juggles of necromancers, with the general ignorance which prevailed amongst the early Christians; and how, at a later period, all Europe descended to the absurdities of Egyptian idolatry in the reverence they paid to amulets and talismans, and in the unreasonable belief which

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* A collection of terms, expressive of different forms of divination, collected from various sources to illustrate bygone superstitions, is given in Dr. Roget's "Thesaurus of English Words." See No. 511.

† The common quacks, who lived amongst the people, robbing the credulous of their money and health, by means of a pretended infallible cure for all disorders, were called *ἀγύρται*, or (Latinised) agyrtæ; those who travelled about from town to town were denominated circuitores, circulatores, circumforanei; some kept shops, wherein they gave advice to patients who visited them, these were called *ἐπιδίφριοι ἰατροὶ*, cellularii medici. In short, the following terms were used to designate as many different species of empirics. Pharmacopœus, *φαρμακὸς*; pharmacotritæ, pharmaceutæ, Seplasiarii, pigmentarii, *παντοπώλαι*, *καθολικοὶ*; herbarii, *ῥιζοτόμοι*, *βοτανικοὶ*; unguentarius, *μυρεψὸς*, &c. See Essai sur le Charlatanisme; Concours, par Léon Rostan.

they reposed in the relics of saints. In short, how in unison with ignorance, fanaticism, and credulity, were the cruel sacrifices of the Druids, the dreams of Geber, the delusions of astrologers, and the imposture of the royal touch ; and how clearly all may be seen to verify the notion, that the aberrations of man result from the circumstances of the age.

In meditating on these successive delusions, and contrasting them with philosophy of a more enlightened epoch ; in considering, too, how infinitely small a proportion of these fallacies is recorded in the most perfect annals, to what are lost in forgetfulness, we are irresistibly led to the conclusion (negative though it may be yet positive in effect) that the errors of all irregular practitioners, up to the end of the sixteenth century at least, were not those fruitful errors which, with more honesty of purpose, have served to build up systems of philosophy. It has been said that people who make mistakes achieve the great things in this life ; but clearly this does not apply to the aberrations of quackery, from which not one iota has been added to the general stock of knowledge, if we except the service which Paracelsus, in his sober and rational moments, rendered to chemistry and medicine, and for which we have accorded our homage to him ; but the contempt which he was pleased to express for sound medical doctrine, even as it existed in his time, was manifestly the contempt of ignorance.

Some apology seems necessary for so constantly dragging forward the heresies of our profession ; but it often happens that the line of demarcation between the regular and irregular practitioner is so faintly marked as to elude the most careful observer. The peculiar genius, however, which prompts a man into the course of the latter, is generally characterised by a peculiar course of reasoning. Living instances of this will suggest themselves to the minds of my readers; but a notable example occurred at the period which we are now considering, in the person of one Andrew Boorde, a native of Pevensey in Sussex, who studied at Oxford, and took his doctor's degree at Montpellier, in 1541. His individual talent, which consisted in a vein of eccentricity both in respect to his writings and practice*, made him a striking contrast to the grave physicians of his day. He is said to have frequented markets and fairs, where people used to assemble in crowds, to whom he prescribed; and, to induce them to flock thither the more readily, he would make humorous speeches, from which the name of "Merry Andrew" is derived.† But his expedient had not the claim of originality; for during the papacy of Julius II. a Dominican monk, named Tetzel, carried on a lucrative trade in the sale of remissions or indulgences, by going about from town to town, accompanied with the ridiculous show and noise of a mountebank; when, we are told, on arriving at the principal church, strange scenes took place, which were too gross even for the chroniclers of those unpolished days to relate.

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* Watts, Bibliotheca Britannica. About the middle of the sixteenth century many works were published to expose quackery; such as the "Empiricus, sive Indoctus Medicus," by Peter Talpa; the "Matæotechnia Medicinæ Praxeos; or, the Vanity of the Craft of Physick," by Noah Biggs; the "Detection and Querimonie of the daily Enormities and Abuses committed in Physick concerning the thre parts thereof; that is, the Physition's part, the part of the Surgeons, and the arte of Poticaries," by John Securis. Even the drama was called in aid of the profession, there being a play entitled "The Four P's, a very merry Interlude of a Palmer, a Pardoner, a Potycary, and a Pedlar," by John Heywoode. London.

† Boorde or Borde was fond of Latinising his name to Andreas Perforatus. His "Dietary of Health" is one of the most interesting and amusing books of the sixteenth century.

But another individual of this class did appear, who, with considerable industry and zeal, collected the materials which the alchemists had fabricated, and made of them, on a Baconian or inductive system, a comparatively new science.

Jean Baptiste van Helmont was born in Brabant in 1577; he studied at Louvain, where he associated himself with Jesuits, of whom one, Martin del Rio, undertook to teach him magic; but he soon saw the futility of it, and turned his attention to the doctrines of the Stoics, likewise with the same result. He next applied himself to the works of Thomas à Kempis, bewildered himself, and left them still more discontented. Seeing the worthlessness of all these studies, he betook himself to medicine, and soon became profoundly versed in Hippocrates and Galen. Happening one day to pick up the glove of a young lady affected with itch, he caught that disagreeable complaint, which, by the Galenists, was attributed to a combustion of the bile, and a saline state of the phlegm. According to their views he took purgatives, and weakened himself without effecting a cure; whereupon he was disgusted with the healing art, renounced it, regretted that he had sacrificed both time and station in descending to it, gave his library to students, and affected sorrow afterwards that he had not rather burnt it, so angry was he with physic.*

He was cured of his malady, however, by means of mercury and sulphur, the Paracelsean remedies, and this originated in him a determination to reform medicine. Like Paracelsus, he travelled for the purpose of discovering secrets, but with the professed object of ascertaining whether there were any that could be said to be really useful.

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* Nouvelle Biographie Générale, par MM. Firmin Didot Frères. An interesting account of the life and opinions of Van Helmont may also be found in Dr. Thomson's "History of Chemistry."

He took his doctor's degree in 1599, married a rich Brabantine lady, by whom he had several children; and, although he boasted of having cured many thousand patients, his appliances failed him when his own family was concerned. One after another, his children died off, and only one was left, Francis Mercurius, who edited his father's works. Eventually, Van Helmont himself, like Descartes, fell a victim to his own doctrine or error, refusing to be bled for a severe inflammation of the lungs; he died in 1644, at the age of sixty-seven.

His personal character is quaintly given by his biographer, Lobkowitz: "He was pious, learned, famous, a sworn enemy of Galen and Aristotle. The sick never languished long under his hands, being always killed or cured in three days." His works were published at Amsterdam, in 1648, by his son Mercurius, who aspired to rival his father, and is described on his tombstone as "Nil patre inferior."

He was a fervent idealist, though conscientious and truthful; enthusiastic and ambitious, but modest and humble; credulous was he also, and superstitious, yet a severe reasoner; and, in the midst of his creative dreams, he would now and then enunciate brilliant truths.* With such conflicting and contradictory elements interwoven in the constitution of his mind, counteracting and correcting each other in such a manner as to temper his imagination with judgment, he laboured with profound thought and strong impulses in the construction and maintenance of a theory which he based upon the hypothetical *archæus* of Paracelsus. This he adopted as an established fact, and engrafted on it those happy discoveries which have entitled him to rank with men whom history honours, notwithstanding that he was exceedingly defective either as a psychologist, chemist, physiologist, or physician.

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* Nouvelle Biographie Générale.

The *archæus* represented to his mind an immaterial force, directing and controlling all bodily functions, and possessing the power of educing all things from water by a species of fermentation. Hence, he regarded water as the principle of all things, and one of his verifications was the growth of a willow, five pounds in weight, which he planted in 200 lbs. of dried earth. At the end of five years, water only having been supplied to it during that period, it weighed 169 lbs. 3 oz.; and, when again carefully dried, the earth had lost only 2 oz. Another proof, which he adduced in evidence of the truth of his theory, was the growth of fish in water alone. These fallacious tests encouraged the fancy which represented water in the earth as the equivalent of the blood in animal bodies, flowing through, and vivifying all terrestrial bodies.*

But he attributed still higher potentiality to the fermentation of water by virtue of the *archæus*. He imagined that a certain body between spirit and matter was so produced, to which he applied the term gas†;

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* Nouvelle Biographie Générale.

† Van Helmont immortalised himself by the discovery of those invisible bodies, to which he first gave the name of gases; hence he may be called the originator of pneumatic chemistry. This discovery was not an accident, but resulted from reasoning on the fact,

this he attempted to prove by the distillation of wood to a state of charcoal, whereby he obtained a colourless fluid, like water; and, by subsequently burning the charcoal, he produced the gas which he conceived to have been formed from the water. When generated in the body by fermentation, this gas was denominated by him *aura vitalis*, the *archæus*, in fact, or generating force which he thus made a self-producing principle. He thought that each member of the body had its own peculiar *archæus*, subordinate to the central or principal one, and that the harmonious action of these affiliated principles produced health, whilst their disagreement caused disease.*

Regardless, or nearly so, of the structure of parts, and thoroughly imbued with the passion for spiritualism, Van Helmont conceived and enunciated a doctrine of bodily functions, in as dry and succinct a form, as he would have used in laying down the canons of any other branch of physical science. With an unconscious and irrational devotion to Paracelsus, he localised the central *archæus* in the stomach; and, when he found that a dose of henbane produced nausea, and impaired mental vigour, he assigned to the stomach the seat of the intellect also. Memory he referred to the brain, desire to the spleen, and volition to the heart: whilst nutrition and growth he explained in six successive acts, and made the seventh, in accordance

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that seventy pounds of oak charcoal on being burnt left but one pound of ash. The invisible product, which he could neither retain in the vessel nor reduce to a visible body, he named gas, from *gahst*, *geist*, or spirit. The same gas he recognised as produced by the fermentation of beer and wine, and the specific name which he gave to it was *gas-sylvestre*, to distinguish it from another gas (*chlorine*), which he made by mixing common salt with nitric acid.

* Nouvelle Biographie Générale.

with nature, a state of repose.* These speculative subjects being peculiarly adapted to the genius of figurative and turgid writing, we find him, whenever he discusses them, distorting his narrative in conformity with his theory; but, in enunciating his hypotheses, or when he condescended to treat of those things which he saw or knew, his unpretending clearness admits of no kind of doubt as to the precise nature of his theories, the discoveries which he made, and the reformations which he effected. He first suggested the use of the balance, which Lavoisier, at a subsequent period, consummated; he was aware of the fact of the expansion of water by heat, and of the diminution of the bulk of atmospheric air by burning substances in it; he first used the term saturation, in relation to the process of solution, and corrected the erroneous notion previously entertained, that the dissolved matter was destroyed or annihilated; he introduced sal-volatile as a medicinal agent, and otherwise reformed pharmacy by substituting comparatively elegant preparations instead of the disgusting decoctions, infusions, and electuaries, which had been used by the Galenists before him.† His contemporary, Andreas Libavius, a German chemist, who was born at Halle in 1560, separated chemistry from the fanatical opinions of Paracelsus; but still believed in the transmutation of metals, and in the efficacy of metallic gold as a remedy in disease. He published the first chemical manual, and thereby presented to the world the most useful book that had ever appeared on the subject.* He is also said to have originated the idea of the transfusion of blood. He was a prolific writer, chiefly on subjects connected with alchemy; but he also wrote some reflections on the reputation and the confessions of the society of Rosicrucians.†

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* The first act he imagined to be performed in the stomach, assisted by the spleen; the second in the duodenum, by the bile; the third in the mesentery, whither, he conceived, the gall-bladder sent the prepared fluid; the fourth in the heart, where he thought the red blood became yellow and volatile by virtue of the vital spirit it acquired in passing through the pores of the septum; the fifth act consisted in the developement of animal heat and the pulse from the admixture of the vital spirit; the sixth was manifested by the secretion of the vital spirit in the brain, when the blood was assumed to possess the requisite qualities for the nourishment of every organ under the superintendence of each subordinate *archæus*.

† Nouvelle Biographie Générale.

To this, the culminating point of the cabalistic system, it will be our painful duty to revert; but we have other delusions to notice, which were never more rife than during the sixteenth century; and hence, clearly as we have shown, and have yet to show, that knowledge was then on the increase, we have equal evidence to be assured that superstition was not on the wane.

One of the best and wisest men of his time, Bishop Hall, confessed that old wives and stars were his counsellors, his night-spell was his guard, and charms were his physician; whilst he wore Paracelsean characters for the toothache, and a little hallowed wax as an antidote for every ill.‡

About the same time, too, Bishop Bonner, in an injunction at one of his visitations, charged midwives against using or exercising any witchcraft, charms, sorcery, invocations or prayers, *other than such as were allowable*, and might stand with the laws and ordinances of the Christian Church.*

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* Alchymia recognita, emendata et aucta, tum Dogmatibus et Experimentis nonnullis, tum Commentario medico-physico-chymico. Frankfort, 1597.

† Wohlmeinendes Bedenken von der Fama und Confession der Brüderschaft der Rosen-Kreutzer.

‡ Brand (John), Observations on Popular Antiquities, vol. iii. p. 269.

Charms, it was believed, had the property of preserving men from wounds in battle, and an oath was administered to persons going to fight a duel, "*that they had ne charm, ne herb of virtue*" as an undue advantage.† But that the practitioners of many fraudulent proceedings were the least believers, is well illustrated in an instance recorded by the facetious Andrew, who continued Dr. Henry's "History of Great Britain." "A poor woman," says he, "who cured all diseases by muttering a form of words over the party afflicted, for which she obtained a penny and a loaf of bread, on being threatened with flames in this world as well as in the next, for witchcraft, confessed that all her conjuration consisted in the following lines, which she always repeated in a low voice near the patient,

'Thy loaf in my hand,
  And thy penny in my purse,
Thou art never the better,
  And I—am never the worse.'"

As if all this were not knavery and credulity enough, every sort of heresy was encouraged and propagated. The bold assertions of fanatics inspired confidence to the depraved and weak, and, by way of episode in the reign of empiricism, ancient authors were ransacked for obsolete doctrines which might be presented to the world, adequately furbished to suit the morals and manners of the time. Now, when we consider that this was the age of Julius II., Leo X., Alexander VI., of Lucrezia Borgia, and Ferdinand d'Este, it will be at once conceded that it was no ordinary appetite for knavery which had need to be gratified; nor was it in that country only, in which those choice specimens of human nature were tolerated, that the love of the marvellous was so unbounded.

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* Brand (John), Observations on Popular Antiquities, vol. iii. p. 269.

† Ibid. p. 270.

The contemporaneous events of other nations disclose facts, which, if duly selected and arranged in their historical order, betray vulgar superstitions and vicious principles, compared with which our experience at the present day furnishes nothing similar, notwithstanding the amount of quackery now practised, and the fact that all our almanacs abound in astrological predictions.

Fracastor, of whom we have spoken, revived the theory of atoms of Democritus; and, by representing the atoms as demons, he struck out a doctrine in strict keeping with the circumstances of the period. These demons were popularly believed to be emanations from the Deity, and the belief engendered a cabalistic theosophy, to which the medical delusions of the day were the most befitting accompaniments.

These were entertained, too, in the minds of men as affiliated subjects of contemplation, just as we may observe nowadays a combination of heterodox doctrines finding a congenial lodgement in one brain.

Reuchlin, Mirandola, Trithemius, and Agrippa * are

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* Reuchlin (Johannes), a native of Pforzheim in Germany, was born in 1455, studied for the law, graduated at Poictiers in 1481,

quoted by Sprengel[*] as having mixed up these mummeries, and made a vain display of them as scientific dogmas.

The delusion was seized on by Pope Innocent VIII. as a reason for issuing a bull, and appointing two public inquisitors for the purpose of arresting the spread of sorcery, for which he affected a great horror; and his two monastic emissaries[†], armed with the additional sanction of the Emperor Maximilian I., were so energetic in the cause, that, in the course of a very few years, they sent nearly 7000 individuals, in the electorate of Trèves alone, to the scaffold for professing the black art. In France, the atrocities which they committed were innumerable.[‡]

In England, as we read in the "Chronicles of Holinshed," "men were given to guess things that should happen by making of strange tokens; thus, in 1506, a tempest blew an eagle of brass from a pinnacle or spire off Paul's church, and in falling it broke another eagle set up for a sign at a tavern in Cheapside. Maximilian gave the eagle; and men deemed that the Emperor should suffer some great misfortune, as he did shortly after by the death of his son, King Philip of Spain.

"And surely," he proceeds, "these prodigious accidents are not to be omitted as matter of course; for

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and died at Stuttgard in 1522. Mirandola (Johannes Pica della), a native of Modena, was born in 1463, studied at Bologna, and died 1535. Trithemius (Johannes), a native of Tritterheim, born in 1462, was made Abbé of Spanheim, died in the early part of the sixteenth century. Agrippa (Livio), native of Cologne, born in 1486, and died in 1536.

[*] Hist. de la Médecine, vol. iii. p. 222.

[†] Henry Institor and James Sprenger.

[‡] Sprengel, vol. iii. p. 232.

they have their weight, and show their truth in the issue."

"Examples in this book* be divers; among which one is very remarkable, mentioned in the thirty and ninth year of Henry VI. At what time the Duke of York, making an oration to the Lords of the Parliament for the justifying of his title to the Crown, it chanced that a crown which hung in the middle of the nether house (to garnish a branch to set lights upon), without touch of man or blast of wind, suddenly fell down. About which season also fell down the crown which stood upon the top of Dover Castle. Which things were construed to be signs that the crown of the realm should some way have a fall; and so it came to pass.

"And because the events of these foreshows had their truth, as many more of the like nature; it shall not be amiss here to add (by way of digression) what hath been observed in former ages, by foreign writers, in and about such foretokens. The consent of the heavens, and of men, pronounced to Italy their calamities to come; for that such as made profession to have judgment, either by science or divine inspiration in the things to come, assured with one voice that there were in preparing, both more great mutations and more strange and horrible accidents, than for many worlds before had been discerned in any part or circuit of the earth. There were seen in the night in Pouille three suns in the midst of the firmament; but many clouds about them, with right fearful thunderings and lightning. In the territory of Aretze were visibly seen, passing in the air, infinite numbers of armed men upon mighty horses, with a terrible noise of drums and trumpets. The images and figures of saints did sweat in many parts of Italy." "In 1542 a Welsh minstrel was hanged and quartered for singing of songs which were interpreted to be prophesies against the king."*

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* Holinshed's Chronicles, vol. iii. p. 535.

Disproportionate as the punishment may seem to us, in relation to the offence, probably it was not thought so in that semi-barbarous age, when the minstrelsy of harpers closed each succeeding night in almost every palatial hall, and prefigured the influence which the press exercises on the million at the present day; when the pretenders to foreknowledge held in absolute bondage the minds of the community; and when demoniacs abounded to such an extent that, in some provinces, public prayers were offered up in churches for the expulsion of the evil spirit.† Even Luther and Melanchthon firmly believed in the possessed, and as firmly thought that diseases sprang from demoniacal influence. It is said that the devil often appeared to Luther in the shape of a monk‡; but very likely the reformer indulged in a little quiet irony as well as in imagination; for his contemporary Tritheim, or Trithenius as he is generally called, evoked demons also; yet they never presented themselves in a monastic dress, probably because, being one of the fraternity himself, he had not so great a horror of them as had Luther.

The Emperor Maximilian, being disconsolate at the loss of his first wife, Marie de Bourgogne, Trithenius is reported to have engaged to make her appear to him, and to have done it so effectually that Maximilian, to satisfy himself it was really she whom he saw, sought for and found a wart which she had on the nape of her neck.* Anecdotes like these show how firm a hold the belief in magic had on the minds of all classes of men at that period; but the date of Marie's death, 1482, is fatal to the truth of this particular occurrence; for Tritheim was then but twenty years old, and it was long before he was an abbé, in which character he is said to have performed the feat. He entertained, however, the credulity and prejudice of his day to the fullest extent, and was the first to write seriously on the enchantments and cabalistical operations of Faust as facts.†

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* Holinshed, vol. iii. p. 822.

† Sprengel, vol. iii. p. 232.

‡ Ibid. p. 233.

One of the most celebrated men of the sixteenth century, and a notable example of the mother's influence on the intellect of her sons, was Pic de Mirandola, who was designed for the church; but the traditionary lore which he was sent to study at Bologna did not satisfy his ardent imagination, and he struck out a course of study in philosophy and theology for himself. He familiarised himself with Greek, Latin, Hebrew, Chaldean, and other Eastern languages, and purchased of an impostor sixty Hebrew manuscripts, containing the most secret mysteries of religion and philosophy, which the vendor assured him were composed by order of Esdras. They were, in fact, nothing more than a collection of cabalistical reveries, to the study of which Mirandola devoted himself, and filled his mind with such chimerical ideas as were published in his "Conclusiones Philosophiæ, Cabalisticæ, et Theologicæ," whereon Tiraboschi remarks, "One can but lament that so fine a genius, such extended knowledge, and so laborious a mind should have been wasted on such frivolous questions." In another work* he defends thirteen propositions, which were denounced by a committee of investigation appointed by Pope Innocent VIII., and which were the immediate occasion of the bull previously referred to.†

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* Biographie Universelle, Ancienne et Moderne, art. "Trithenius."

† Ibid.

Henry Cornelius Agrippa resembled, in many respects, his contemporary Paracelsus. Like him he was half charlatan, half fanatic; and, like him, he fascinated the ignorant by his extravagant doctrines, which harmonised only with his vagabond life. In 1524 he pretended to practise medicine at Lyons, where he was patronised by Louise de Savoie, mother of Francis I., who appointed him her physician; but he very soon disappointed her hopes, by refusing to foretell the future destiny of France, although he did not hesitate to predict new triumphs for the Constable de Bourbon.‡

A most zealous abettor in the cause of necromancy appeared in the person of Jerome Cardan, who was born at Pavia in 1501, and received his degree of Doctor in Medicine at Padua in 1525. His writings on astrology and medicine show how fully he was endowed with that puerile affectation of despising those rules of conduct which ordinary men observe, by way of gaining credit for an eccentric genius; and it is to his own account of himself that we are indebted for the information we possess of his intense vanity, consummate selfishness, gross superstition, and arrant untruthfulness. To one thing only was he faithful, and that was to the vanity of being thought an oracle. De Thou, who knew him personally, states that it was commonly believed his end arose from starvation, voluntarily undergone, that he might not outlive the time which he had predicted for his own death.*

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* Apologia J. Picis Mirandulani Concordiæ Comitis. 1489.

† Biographie Universelle.

‡ Penny Cyclopædia, art. "Agrippa."

Immediately after the Reformation all this demonomy increased prodigiously, in consequence, as it was sagaciously alleged by Moehsen, in his "History of the Sciences," of the cessation of pilgrimages, which, if there were truth in the suggestion, acted as a moral safety-valve; but, in the very midst of the delusion, two honest men raised their voices against it, and endeavoured to dispel the hallucinations of their day, as well as to stop the flow of innocent blood which Institor and Sprenger, the inquisitorial agents of the Pope, were so wantonly shedding. These two men were John Wier and Reginald Scot.

Wierus, a Dutch physician, was a friend of Agrippa, by whose means he discovered and exposed the tricks of many pretended demoniacs. He revealed, too, the false accusations and unwarranted cruelties of the Papal emissaries, by whose casuistry so many human sacrifices were made. In his work† he employed the artifice of admitting the possession of a certain influence in his Satanic Majesty; but clipped him of power, bit by bit, as he succeeded in explaining each obscure phenomenon by natural means, until at last nothing was left to combat; and thus he rescued many victims from the hands of jurists, who continued to condemn sorcerers as the instruments of the spirit of evil.

Reginald Scot was a far superior writer, and the most distinguished opponent of the delusion of witchcraft. After studying at Oxford he went to live in Kent, where he devoted himself to the study of old and obscure authors, the result of which was a work*, wherein there is a mixture of great sagacity with considerable absurdity. His great object, as stated in the introduction, was to show the error of believing that witches contracted with devils, spirits, familiars, &c., to kill, torture and consume the bodies of men, women, and children, or other creatures, by diseases or otherwise. The practices of "witchmongers, conjurors, enchanters, soothsayers, as well as the delusions of astrology, alchemy, legerdemain, and other hidden things," he abjured, for the purpose of undeceiving judges, justices, and juries, and for the preservation of poor people.

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* The works of Cardan were collected and published under the title of "Hieronymi Cardani opera omnia, curâ Caroli Sponii," in 10 vols. fol. Lyons, 1663.

† De Præstigiis Dæmonum. Amstelod. 1660.

Denying as he did any power in the Devil, in that age of credulity and superstition, he incurred the obloquy which was sure to be visited on every rational and unprejudiced man; as did also Thomas Lieber, a German philosopher, who changed his name to Erastus, and was the chief of the Erastians.† He was the most celebrated antagonist of Paracelsus, although he foresaw in chemistry the means of explaining the great enigma of creation‡; and was equally opposed to astrology and demonomy, although he endeavoured to show that the possessed had abjured God and made a compact with the Devil, who taught them how to use magic words, plants, and other things, innocent in themselves, to contravene the natural order of things.§ His opinions coincided with those of Scribonius, who was nevertheless opposed to Wier, and recommended the trial by water to discover sorcerers.* By this ordeal the odds were fearfully against the suspected; for, if they escaped drowning, they were, *ipso facto*, proclaimed guilty and burnt accordingly.

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* Discoverie of Witchcraft. 1584.

† Erastus was born at Auggenen (Bade Durlach) in 1523, and died at Basle in 1583.

‡ Nouvelle Biographie Générale.

§ Erasti Disputatio de Lamiis seu Strigibus. Basil, 1572.

Another author of some celebrity, whom Dr. Watt called a learned pedant and intriguing courtier, took up arms against the prevailing illusion of witchcraft. Henry Howard, Earl of Northampton, published "A Defensative against the Poyson of supposed Prophecies; not hitherto confuted by the penne of any man, which being grounded eyther uppon the warrant and authority of old paynted bookes, expositions of dreames, oracles, revelations, invocations of damned spirits, judicialles of astrologie, or any other kinde of pretended knowledge whatsoever, de futuris contingentibus, have been causes of great disorder in the commonwealth, and cheefely among the simple and unlearned people; very needefull to be published at this time considering the late offence which grew by most palpable and grosse errours in astrology."†

In these polemics even royalty entered the lists; for James I. of England, who was in other respects a voluminous author, wrote a book‡, as he states, "chiefly against the damnable opinions of Wierus and Scot; the latter of whom is not ashamed in public print to deny there can be such a thing as a witch."

His Majesty was ably seconded by John Bodin, a great political writer, who sensibly influenced the study of medicine also, by sustaining the vulgar notions of witchcraft; bringing to his aid therein all that sacred and profane history, the accounts of travellers, or the Roman lawyers could supply. Beside his superstitious absurdities, however, he was guilty of exciting the magistrates against Wierus, by representing him as a real confederate of Satan.* Bodin professed a disbelief in any influence of the stars over human affairs, yet he gave up his better reason to the prejudices of his age, acknowledging astrology to be a theoretical truth, and the hypothesis of Copernicus too absurd to deserve refutation; since, being contrary to the tenets of all theologians and philosophers, as well as to common sense, it subverted the foundation of every science.†

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* De Sagarum Naturâ et Potestate, ut et Examine per Aquas. Helmst. 1584.

† This book was published in 1583, and is well analysed by Oldys in his "British Librarian."

‡ Dæmonologie (a dialogue in three books in defence of the belief in witches). 4to. 1597.

There is nothing, perhaps, very repugnant to human reason in the science of astrology; for many of the most illustrious men of all civilised countries have adopted it after a long course of preliminary education; and it should be remembered that the very argument, the bias of education, which was once held as conclusive in its favour, is now quoted as decisive against it.

In the sixteenth century, literature and medicine were so inextricably interwoven with judicial astronomy, that it is scarcely possible to enter into the spirit of the age without knowing that many of the best and wisest of men regarded the heavenly bodies simply as the instruments by which the Almighty regulated the course of events in this world, giving them different degrees of power according to their different positions in space. The ignorant, on the contrary, looked on the stars themselves as the primary agents in effectuating our weal or woe, just as the idolater regards the image of his saint as the veritable saint himself.

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* "Demonomanie des Sorciers." It has been alleged that Montesquieu borrowed much that is contained in his "Esprit des Lois" from Bodin's "Republic," which was first published in French in 1577; but when he came to England in the service of the Duke of Alençon, and found his work explained by lectures both in London and Cambridge, he translated it into Latin, that it might be more universally read.

† Penny Cyclopædia, art. "Bodin (John)."

Men of education parcelled out the face of the heavens into twelve divisions or houses, with as much precision as if they were laying out a Dutch garden; and the principal planet which happened to be in any one of the houses at any particular period of time, they denominated the lord of the house.*

To each house they assigned a special destiny, much in the same way as Gall and Spurzheim localised our intellectual faculties, moral sentiments, and animal instincts, in particular sections of the brain.

To both systems the objection might be opposed, that they lead to fatalism, and destroy moral responsibility; but, in dealing with any doctrines, we must not shut our eyes to facts, nor yield to the timid and absurd apprehension of exercising the mind in the investigation of truth. Irrespective therefore of its consequences, and having ample data to guide us, we may now look back, and, with a candid mind, declare that the arguments on which astrology is founded are uncertain and contradictory, and that the predictions to which it aspires are not borne out by the events.

Each astrologer may have been as familiar with his heavenly houses as with the ground plan of his own terrestrial abode; but the greatest authorities differed as to the mode of defining the boundaries*, some projecting their lines in one direction, some in another; hence the uncertainty. There was also endless room for ingenuity in the juxtaposition of the various houses; just as we see the same effect in the various figures presented in a kaleidoscope or a Chinese puzzle. When to this we add that the lords were supposed to exercise their influence in various ways, according to the houses they happened to be in, or according to their relative position with one another, we may imagine how contradictory were the elements of calculation. They afforded, however, the means of connecting every remarkable event with some antecedent sign in the heavens, if they failed to supply the infallible grounds for prediction.

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* The first house or ascendant was the house of life; the second, of riches; the third, of brethren; the fourth, of parents; the fifth, of children; the sixth, of health; the seventh, of marriage; the eighth, of death; the ninth, of religion; the tenth, of dignities; the eleventh, of friends; and the twelfth, of enemies.

Some successful forebodings are recorded which might find a satisfactory solution in the doctrine of probabilities, even in special cases like that which Sprengel relates of Valentine Trutiger†, who, remarking that the town of Brandebourg had been visited by a pestilential disease on occasions when Mars and Saturn were in conjunction in the sign of Cancer, predicted a recurrence in 1564, which was verified; but it would be interesting to know how often such conjunctions have occurred without the accompanying pestilence, and how great a proportion of failures there have been in horoscopy to the number of lucky hits.

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* M. Pelletier, who introduced algebra into France, informs us that "Some cut the horizon into equal parts, some a vertical circle, some the equator, some the ecliptic, some a parallel; whence it is not wonderful that a difficult art should be involved in fresh obscurity; for who can possibly see a living likeness in a mirror which is put out of shape in so many ways?"

† Sprengel, vol. iii. p. 252.

Amongst the offenders against scientific principles and common sense, physicians stand conspicuous in the list of astrologers.* Possibly the custom of writing calendars, which obtained amongst physicians, may account for the maintenance of this union of astrology with the healing art, notwithstanding its manifest effect of favouring the predominance of the imagination over reason and judgment.

But, at that epoch, the early education of the mind lacked that discipline and training which are so necessary to the discovery of those immutable laws, manifested in the living forces and in their aberrations, whereby we are enabled to view them in their relation of cause and effect. All physiology was conjectural, and therefore was there some kind of excuse for such men as Mizauld and Nostradamus, who sought for causes of diseases, and for their remedies, in the relative position of planets, instead of in the observation of phenomena occurring in the human body.

Astrology prevailed much more in Germany than in any other country; but it was also popular in Italy, France, Spain, and England.

The Earl of Northampton, in his "Defensative," already quoted, remarks on the prevailing system of astrology "that the houses, faces, images, aspects, &c.,

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* Grässe's "Allgemeine Literärgeschichte" contains a most copious history of all the works written on astrology. See the 3rd part of vol. i. from p. 936. Moehsen has also given a table of astrologers, wherein all classes, from princes to peasants, may be found, and many physicians amongst them. H. Rantzau also published his "Catalogus Imperatorum, Regum, ac Principum, qui Astrolog. Artem amârunt, ornârunt et exercuerunt," &c. Antverp. 1580.

which it ascribes to planets, are neither apparent to sense, nor revealed in philosophy; and that it is impossible for one or all of the planets to suppress the properties of nature." At the end of his book he quotes numerous examples of false predictions.

Another work by Dr. John Cotta, a physician of Northampton, was the result of ten years' observation and experience of the frauds and corruptions in physic, so commonly practised at that time.* He speaks in no measured terms of the barbarous and unlearned counsellers of health, who overspread all corners of the kingdom; and, curiously enough, alludes more particularly to those individuals who gave the greatest amount of trouble to the college of physicians in the sixteenth century.

Artisans, women, priests, witches, conjurors, and fortune-tellers were the chief medicine-mongers who made a profitable trade of homicide, and Cotta denounces them, together with the cabalists, astrologers, necromancers, and alchemists. He wrote also on the great wonder of the day, which filled up the measure of human credulity.

It was said, and generally believed, that a golden tooth had been developed in a Silesian youth. Without doubting the fact, James Horst, a physician at Helmstaedt, wrote a treatise on it†, and accounted for the phenomenon by attributing it to a conjunction of the Sun with Saturn in the sign of Aries, when the child was born. The sudden accession of heat, he imagined, had stimulated the nutritive force to such an extent as to cause the secretion of gold instead of bone. Duncan Liddel, a canny Scotchman, shrewdly hinted that, inasmuch as the friends of the boy were unwilling to allow the tooth to be examined, it might possibly be gilded, and great was the speculation on the subject.* Two German physicians, Martin Ruland of Ratisbon † and John Ingolstetter of Nuremberg ‡, believed in it; but Cotta took the more rational view of Liddel; and some other of his observations are so much in unison with feelings recently expressed by an eminent modern writer §, that, allowing for the high tone of morality at the present day, which was notoriously bad then ||, his remarks on the practice of women about the sick, as commenders of doctors and drugs, and his warning to patients against consulting with petticoat practitioners, whom he advised to prescribe rules of conduct to themselves, rather than physic to their friends, would, in many instances, find a responsive chord in the

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* A short Discourse of the unobserved Dangers of several sorts of ignorant and unconsiderate Practisers of Physicke in England, profitable not only for the deceived multitude, and easie for their mean capacities, but raising reformed and more advised thoughts in the best understandings; with Directions for the safest election of a Physician in necessitie. By John Cotta, M.D. 4to. Lond. 1612.

† Horst, De aureo Dente maxillari Pueri Silesii. Lips. 1595.

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* Liddel, De Dente aureo. Hamb. 1628.

† Ruland, Nova et in omni memoria inaudita historia de aureo Dente, qui nuper in Silesia Puero cuidam septenni succrevisse animadversus est. 4to. Francof. 1595.

‡ Ingolstetter, De aureo Dente Pueri Silesii Responsio ad Judicium Rulandi, quâ demonstratur, neque dentem, neque ejus generationem naturalem esse. Lips. 1596.

§ Dr. J. Brown, in his work on Lock and Sydenham, says: "Every one is for looking after and talking of every body else's health, and advising and prescribing either his or her doctor, or drugs," &c.

|| See Latimer's Sermons, p. 103, which attest the prevalence of all kinds of vices; but Dr. Henry observes that "their magnitude is not so certain when transmitted through the medium of intemperate zeal."—*Hist. of Gt. Britain*, vol. xii. p. 360.

middle of the nineteenth century. Happily there is much good sense now to moderate the ill-judged zeal; but Cotta's allegation, like the reflux of a tide which leaves behind it a few stray shells to mark its course, has bequeathed to us the traces of vexatious interference, teaching us that human nature is ever the same.

The legend of the Nun of Kent is a remarkable instance of the insatiable appetite of human credulity for all that is marvellous and apparently supernatural; it shows, too, how difficult it is to maintain the judgment in a state of healthy equipoise, not only as regards the spectators, but also as regards the agents of such phenomena. Not, alas! that we require to go so far back for evidence of this kind; seeing that we are daily reminded to what excesses belief may be carried, even when the judgment is intrenched behind the defences which modern science supplies.

In 1525, a poor country girl, named Elizabeth Barton, a servant of Thomas Cobb, who was a bailiff of the Archbishop of Canterbury, became so reduced by a disease from which she had long been suffering, that she began to exhibit symptoms of somnambulism and clairvoyance.

The case is so interesting, as related by Mr. Froude, that I shall venture to transcribe from his work* a brief outline of the circumstances, so far as they serve to illustrate the above remarks.

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* Froude's "History of England," vol. i. p. 295 et seq., and vol. ii. p. 164 et seq. Other records concerning the Nun of Kent are contained in a letter of Archbishop Cranmer (Ellis, 2nd series, vol. ii. p. 314), showing that Elizabeth Barton had many and divers trances; Statutes of the Realm, 25th Henry VIII. cap. 12, showing that she spake words of marvellous holyness in rebuke of sin and vice; also in "Papers relating to the Nun of Kent," Rolls House MS.

"This Elizabeth Barton, in trances of which she had many and divers, told wondrously things done and said in other places, whereat she was neither herself present, nor yet had heard no report thereof.

"To simple-minded people, who believed in Romanism, and the legends of the saints, the natural explanation of such a marvel was, that she must be possessed, either by the Holy Ghost, or by the devil. The archbishop's bailiff, not feeling himself able to decide in a case of so much gravity, called in the advice of the parish-priest, one Richard Masters; and, together, they observed carefully all that fell from her. The girl had been brought up religiously; and, her mind running upon what was most familiar to it, 'she spake words of marvellous holyness in rebuke of sin and vice,' or, as some account says, 'she spake very godly things concerning the seven deadly sins, and the Ten Commandments.' This seemed satisfactory as to the source of the inspiration. It was clearly not a devil that spoke words against sin, and, therefore, as there was no other alternative, it was plain that God had visited her.

"An occurrence of such moment was not to be kept concealed in the parish of Aldington. The priest mounted his horse, and rode post-haste to Lambeth, with the news to the Archbishop of Canterbury. The latter assured Father Richard, that the speeches which she had spoken came from God; and, bidding him keep a diligent account of all her utterances, directed him to inform her, in his name, that she was not to refuse or hide the goodness and works of God.

"Perceiving herself to be made so much of, to be magnified and much set by, by reason of trifling words spoken unadvisedly by idleness of her brain, she conceived in her mind that, having so good success, and furthermore, from so small an occasion, and nothing to be esteemed, she might adventure further to enterprise, and essay what she could do, being in good advisement and memory.

"The archbishop caused two monks, Doctor Bocking, and Dan William Hadley to go to Aldington to observe. With instructive knowledge, Bocking discovered materials in Elizabeth Barton too rich to be allowed to waste itself in a country village.

"Partially believing in her himself, he was more anxious to insure the belief of others, and, therefore, set himself to assist her inspiration towards more effective utterances. Accordingly, he instructed her in the catholic legends and in the revelations of St. Bridget and St. Catherine of Sienna.

"In these women, he found an enlarged reflection of herself; the details of their visions enriched her imagery, and, being provided with these fair examples, she was able to shape herself into the fuller resemblance with the traditionary model of the saints.

"As she became proficient, Father Bocking extended his lessons to the Protestant controversy, initiating his pupil into the mysteries of justification, sacramental grace, and the powers of the keys. The ready damsel re-delivered her instructions to the world in her moments of possession; and the world discovered a fresh miracle in the inspired wisdom of the untaught peasant.

"A book was written, containing her oracles, which soon extended to a considerable volume. This was shown by Archbishop Warham to the king, who sent it to Sir Thomas More, desiring him to look at it. More's good sense had not yet forsaken him; he pronounced it 'a right poor production, such as any simple woman might speak out of her own wit;' and Henry himself esteemed the matter light, as it afterwards proved lewd."

Encouraged, as she was by the priest, the Nun next prophesied that "if Henry persisted in his resolution to put away Queen Catherine, and to marry Anne, he would lose his power within a month;" but the prediction failed for a year, "whereupon the king was declared to be in the condition of Saul after his rejection from his kingdom by God."

Not content with this, however, a plot was formed against the king for the purpose of realising some part of the prediction, wherein Elizabeth Barton was implicated, and for which she was attainted of high-treason, and executed; but, just before she suffered, being allowed to address the public, she confessed that she had been beguiled into her presumptuous practices, and that her prophecies were feigned.*

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* The following were the last words of Elizabeth Barton at Tyburn: "Hither am I come to die, and I have not been the only cause of mine own death, which most justly I have deserved; but also I am the cause of the death of all these persons which at this time here suffer. And yet I am not so much to be blamed, considering that it was well known unto these learned men that I was a poor wench without learning, and therefore they might have easily perceived that the things which were done by me could not proceed in no such sort; but their capacities and learning could right well judge that they were altogether feigned. But because the things which I feigned were profitable unto them, therefore they much praised me, and bare me in hand that it was the Holy Ghost, and not I that did them. And I, being puffed up with their praises, fell into a pride and foolish fantasye with myself, and thought I might feign what I would, which thing hath brought me to this case, and for the which I now cry God and the king's mercy, and desire all you good people to pray to God to have mercy on me, and on all them that suffer with me."—*Froude's History of England.*

Had the king himself made a similar confession respecting the presumptuous practice and feigned efficacy of the royal touch (for it is scarcely possible, shrewd as he was in most other things, that he could have believed in that), he would have relieved medicine of one great delusion, which the most triumphant success could barely have justified.

At no time was the illusion more popular than during the sixteenth century, when a controversy arose between the obsequious physicians of the courts of England and France on the question of priority and idiocrasy of the special gift. André Dulaurens, for instance, in other respects a conscientious practitioner of medicine, and a justly celebrated professor at the university of Montpellier, when appointed physician to Henry IV. and Chancellor of that university, wrote a treatise for the purpose of establishing the prerogative of the miraculous gift of curing scrofula by the imposition of hands, to the kings of France*, and asserted that he had himself witnessed many cases; he also gave an account of the ceremony of touching, like that which has been referred to as written by John Browne, surgeon to Charles II. But it so happened, that his sycophancy was, incidentally, also a blunder; for Dr. William Tooker, appealing to historical facts, showed that the practice began somewhat earlier in England than it did in France, and, naturally enough, ascribed to the kings of England the possession of the gift.†

At the present day we are not likely to be charged with discourtesy in denying the tenure of the power in either case; nor is it so disagreeable now, as it might have been then, to dilate on the unsoundness of the paradox, when the monarchs, taught by the adverse influence of failure, emancipated themselves from the degrading duty of maintaining the fanatical ceremony. In addition to the above, a truthful picture demands one word more on the absurdities of alchemy, which had never more votaries than during the sixteenth century, when all degrees of men, from kings downwards, deluded by lazy monks and itinerant scholastics, embarked in the pursuit of the art*; but many, conscious of the spirit of charlatanism which pervaded it, adopted other names than their own when writing on the subject.† Metallurgy, however, and other practical arts allied to chemistry, were practised with considerable zeal and in many cases with great success ‡; but beyond the influence they may have had, in the hands of Providence, as excellent means of bringing to advantageous ends cognate researches in the healing art, they are foreign to our subject.

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* De mirabili Strumas sanandi Vi Regibus Galliarum Christianis divinitus concessâ. Paris, 1609.

† Charisma, s. Donum Sanitatis, s. Explicatio Quæstionis in Dono sanandi Strumas concesso Regibus Angliæ. Lond. 1609.

To those who have carefully read and naturally reflected on the course of the medical profession during the sixteenth century, the foregoing pages will afford but a bare sketch of the innumerable forms of quackery which were presented to the credulous inhabitants of the Christian world. But, as any further details would be rather curious than instructive, it will be more advantageous to inquire how it was that medicine remained so indelibly impressed with all the superstitions of the dark ages, even after the noble efforts which have been noticed to emancipate it.

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* Sprengel, vol. iii. p. 265.

† Ibid. vol. iii. pp. 263, 267.

‡ George Agricola of Saxony, Vanucio Biringuccio of Sienna, Andrea Cesalpinus of Arezzo, and Perez de Vargas of Madrid, are enumerated by Hoefer, in his "History of Chemistry," as the principal metallurgists of the sixteenth century, to which the name of Bernard Palissy should be added for his persevering researches in the art of pottery. An elaborate list of alchemists from Hermes, who is represented to have flourished two thousand years before Christ, down to Mathieu Dammy, is given in Dufrenoy's "Histoire de la Philosophie Hermétique."

A modern French writer has suggested one short way of accounting for it, by concluding that the reign of charlatanism is eternal, and that it will never fail to the world, whatever the world may do to it.*

We may, however, take a less summary view of the case, and without any call on the fancy affirm that, in a profession like medicine, the very nature of the necessary inquiries renders self-deception so easy that every opportunity is, and ever has been, afforded for pretentious quackeries.

At the period we are treating of, moreover, much as had been done, the knowledge of structure and function of the human body was still far from perfect; and although Hippocrates had been studied, and the minds of physicians had been diverted from the infallible sentences of the Arabs and other equally effective mummeries, to the observation of nature, still the works of the Greek master had not been sufficiently digested to impart even an idea, much less a knowledge of the great influence which the epidemic constitution of the year exercises on the features of disease, nor was that peculiar influence fully appreciated until the time of Sydenham.

Physicians had not, therefore, the assistance of the power which we possess, of weighing probabilities; and to criticise them too severely, with the superior knowledge and advantages which we enjoy, is not only illiberal, but as repulsive as exultation over the blind, the deaf, or the lame. Even at the present day we are not without ample evidence how credulous a man may be of every idle tale, who is deficient in that valuable element of balancing probabilities in forming an opinion.

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* J. M. Guardia, Vicissitudes et Progrès de la Médecine; Revue des Deux Mondes, Nov. 15th, 1859.

The wonder is that, in spite of such adverse circumstances, we can clearly trace the growth of a system of medicine, purified from superstition on the one hand, and on the other raised above a mere empiricism by its new and still increasing bearings on physiological and chemical sciences.

The truth is, however, that the marvellous industry and the successful labours of the anatomists of the sixteenth century, beginning with Gabriel de Zerbi and ending with Fabricius of Aquapendente, impressed on the few, who had the faculty of appreciating it, the fact that we are fearfully and wonderfully made; and so directed their thoughts and regulated their practice, as to form a powerful corrective for the errors which they saw and lamented in others.

They were incited, too, by the strongest motives to exertion; for malignant epidemics were infinitely more common during the period above referred to, than they had ever been before; and, from fevers and ulcers forming subjects for discussion in the works of almost every medical author, we may reasonably infer that the former were the most prevailing and most persistent forms of epidemics, and the latter the most prevailing result of the disease which, according to Fernel, appeared in the French army at Naples in 1493.

The manner in which they rescued their noble vocation from the wicked arts of designing men and the dark errors of ignorance, was in conformity with that experience which encourages us to entertain hope even when told to despair ; and to confide in a future, though the prospect offers no ray of light to cheer us ; for it is not when the horizon is at its darkest that we have most to fear.

CHAP. XI.

SECRET POISONING AND MEDICAL JURISPRUDENCE. — MONOGRAMS, AND THEIR INFLUENCE ON PATHOLOGICAL ANATOMY, OF THE SIXTEENTH CENTURY.—SURGERY.

It is with no vain-glorious spirit of boasting, but rather with thankfulness of heart for the good which the errors and delusions of the sixteenth century brought about, that we commence this chapter with the exultation that in the midst of the greatest calamities, whether of plague, pestilence, or famine, battle, or murder, the members of the medical profession have ever stepped forth to assuage suffering, arrest disease, and pour the balm of comfort on the afflicted soul.

Their efforts, it is true, have been attended with varying success; but they have never been weighed in the balance and found wanting, to meet the exigencies of their fellow-creatures.

When human wickedness has from time to time startled the world by the diabolic practice of poisoning, the physician has always been appealed to for the purpose of proving the culpability of the guilty, or of protecting the innocent.

It is not intended here to discuss the question of subtle poisons, which are said to have been concealed under the stone of a seal or ring, or of airy vapours arising from perfumed gloves and letters, for they have been pronounced the idle inventions of ignorance and superstition; although Beckmann has asserted that poisons were prepared with so much art and success in France and Italy, during the seventeenth century, as to bring about the death of their victims at a certain period previously determined; but this also is a fallacy, for the art of poisoning was never carried to such a refined pitch.*

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* Beckmann, in his chapter on Poisons, has referred to Theophrastus, who speaks of a poison which could be moderated in such a manner as to have effect in two or three months, or in as many years; and he remarks that the death is most miserable when most lingering. This poison was prepared from the aconite, a plant which, on that account, people were forbidden to have in their possession under pain of death. He relates also that Thrasyas had discovered a method of preparing, from other plants, a poison which, given in small doses, occasioned an easy but certain death, and which could be postponed for a long time. Alexias, the pupil of Thrasyas, carried the art still farther. Plutarch informs us that a slow poison was administered to Aratus of Sicyon, which produced cough, spitting of blood, consumption, and weakness of intellect. Quintilian also speaks of this poison in such a manner as to prove that it must have been well known. "Venenum," says he, "putabis quidquid dederint hæ manus. Et virus præsentaneum paro, quod statim, quod subito corripiat? At quemadmodum mihi supersit ulla defensio? An lentum, et quod tarda peste consumat, scilicet, ut non statim exclames, ut te meum virus bibisse non credas." Whereupon Beckmann argues that such an invention was not too great for that period, from lack of chemical knowledge, seeing that the savage American Indians administer subtle poisons with so much skill, that the person to whom it is given cannot guard against the treachery, but infallibly dies.

Sejanus caused a secret poison to be administered to Drusus, who gradually declined and died. Agrippina also, desiring to get rid of her husband Claudius, but fearing to kill him suddenly, yet wishing to prevent him making any new regulations respecting the succession to the throne, chose a poison which should deprive him of his reason and gradually destroy him. This she contrived by the aid of Locusta, an expert poisoner, who had been condemned to death for her infamous conduct, but was saved to be employed as a state

The poisons of the ancients were chiefly of a vegetable character; such, for instance, as the aconite, the hemlock, the poppy, and the poisonous mushroom. The acrid secretion of the Aplysia was also known and used by Domitian to destroy Titus; but it was seldom employed, as it betrayed itself by some peculiar symptoms.

From occasional glimpses which we obtain of the manners and customs of later periods, we find that secret poisoning was not unfrequently practised; thus we read in the French Chronicles that after the death of Gaultier Giffard, Count of Buckingham, in the early part of the twelfth century, Agnes his wife was enamoured with Robert, Duke of Normandy, and attached herself in an illicit manner to him, shortly after which time his wife Sibylle died of poison.

But in no period of history do we read of a greater degree of brutality in the pursuit of this most horrible of arts than was displayed by Alexander VI., and his son the Duke Valentinois, who provided themselves with more powerful appliances, which they found in arsenic, for their fiend-like work. They practised it, not only to be avenged of their enemies, but also from an indomitable covetousness to despoil their friends and familiars, who had never done them wrong. Thus perished by their hands the cardinals of Capua and

engine. The poison given was a dish of mushrooms. Locusta also prepared the poison with which Nero killed Britannicus, the son of Agrippina, whom his father Claudius wished to succeed him on his throne. Locusta had pupils to instruct in her wicked art, in order that it might not be lost.

In the "Encyclopædia Metropolitana" (vol. xi. p. 476), it is recorded of Otho III. that he was poisoned by Stephania, widow of Crescentius, by a pair of perfumed gloves.

Modena[*], and Alexander himself, by a cup intended for Adrian, Cardinal of Corneto, who had invited the pope to a banquet in the vineyard of Belvedere, was destroyed instead of his host.[†]

In 1536 the Dauphin, eldest son of Francis I., died suddenly, and it was given out that he drank largely of cold water whilst playing at tennis; but suspicion attached to Sebastian Montecuculi, a Ferrarese, who held the post of cup-bearer; bribed, as was supposed, by Catherine de Medicis, in order to secure the crown to her husband, Henry Duke of Orleans, who became Dauphin, in consequence of his elder brother's death.[‡]

The foul practice extended to this island also, for we read in Stow[§] that in 1531, one Richard Rose, a cook, was boiled in Smithfield for poisoning of divers persons, to the number of sixteen or more, at the Bishop of Rochester's place, and that he intended to poison the Bishop, but failed. Also in 1542, Margaret Davy, a maid, was boiled in Smithfield for poisoning of three households that she had dwelled in.[||]

These, and other vicious habits, which have been alluded to, were the occasion of the first work on medical jurisprudence, by Paul Zacchias[⸸], who studied medicine with great zeal, and devoted himself more particularly to that part of it which is used to guide and elucidate cases before legal tribunals. With prodigious research he collected his materials from more than 460 authors, and has bequeathed to us a perfectly classical treatise on the subject.

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[*] Holinshed's Chronicle, vol. iii. p. 538.

[†] Encyclopædia Metropolitana, vol. xii. p. 387.

[‡] Ibid. p. 380.

[§] Stow's Chronicle, p. 559.

[||] Ibid. p. 583.

[⸸] Pauli Zacchiæ, Medici Romani, Quæstiones Medico-legales in quibus eæ Materiæ, quæ ad Legales facultates videntur pertinere proponuntur, pertractantur et resolvuntur. Opus Jurisperitis apprime necessarium, Medicis perutile, cæteris non injucundum. Rome, 1621.

The scattered elements thus accumulated and arranged represent the precise amount of knowledge which was then possessed in toxicology, hence an analysis of the chapter relating to poisons may not be uninteresting to the reader.

After defining poisons to be, those substances which are used as such, and not those which are employed as restoratives in disease, he divides poisons into internal and external; the latter of which he makes to comprise those agents and influences whereby life may be destoyed through either one of the organs of the senses, the most potent being the bites of venomous serpents.

And here Zacchias shows himself to have been strongly tainted with the superstitious notions which then prevailed, for he expresses his belief in the poisonous effects of the root of the banana when simply touched, and in the power of the fruit of the same as an antidote; and quotes Andræas Cæsalpin for an authority.* He likewise gave full credence to the assertion of Ambrosius Paræus, that the Turks had a poison of such virulence, that the bare touch of it would destroy life in a single day.

His third question refers to the division of poisons in accordance with their effects, into fatal and non-fatal, or such as may be used as medicaments; after which he proceeds, in a fourth question, to consider the qualities of poisons, or, in other words, their occult nature, and the doses required to produce their fatal effects.

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* See Andræas Cæsalpin. lib. iii.

In his fifth he propounds the doctrine of self-generated poisons, but limits his belief in them to the corrupt humours secreted from wounds, which, he thought, might by "mining all within, infect unseen." He then proceeds to consider the question of specific symptoms as following the ingestion of poisons, on which he quotes Cardanus, who determines it in the affirmative.* But, as if conscious of the fallacy of his authority, he, seventhly, discusses the import of the symptoms indicated, and wisely concludes that they should not be accepted as evidence, unless they supervene suddenly and without any evident cause.

The question of inborn poisons is made the subject of his next inquiry, to which he yields his assent on the strength of that peculiar idiosyncrasy which causes the poisonous action of particular aliments on some individuals, whilst they serve the purpose of wholesome food to others. In this determination he was evidently biassed by the then popular belief that a mutual antipathy exists between different poisons, and that one expels another; for on that tenet he settles his next inquiry, as to whether one poison has the power of resisting another; and then proceeds to the interesting problem of "poisonous compounds, which are the movers of a languishing but *timed* death."

On this point, which forms the topic of his tenth question, he falls in with the opinion generally entertained at the time he wrote, and believed in—

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* "Et sudor frigidus cum ardore semper est certum signum assumpti veneni, præsertim si adsit dolor maximus in intestinis."—*Cardanus.*

——"a mortal mineral, which, being took,
Should by the minute feed on life, and, ling'ring,
By inches waste you." *

He alluded to Cæsar Borgia, who attempted to destroy the whole College of Cardinals by a poison that could be timed; and appealed to the varying intervals observed in the action of different medicines as well as to the poison of hydrophobia, which will lie dormant in the animal body a year or more; and hence concluded that the period of time at which the operation of poisons should be accomplished might be predetermined.†

In the next place he enters upon the consideration of those appliances by which poisoning is possible, which is little more than a recapitulation of his second inquiry; and terminates the subject, first by giving a list of poisons which were interdicted for sale‡, and finally by a candid avowal of his belief in the efficacy either of charms or enchantments, the expedients of the devil, as means for the destruction of human life.

Zacchias was a public benefactor, but it would be a fallacy to represent him as successfully meeting the emergency which he endeavoured to check: for, after all, his seventh question is the only practical part of his treatise, and that merely pertains to the circumstantial

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* Cymbeline, act v. scene 5.

† The converse of this particular form of poisoning appears to have been equally believed in. More than once does Shakspeare allude to drugs which destroy all signs of life for a time, and refresh the spirits on reviving. See the speech of Cornelius to Pisanio in Cymbeline, act i. scene 6; see also the speech of Friar Laurence to Juliet, in Romeo and Juliet, act iv. scene 1.

‡ The chief substances so prohibited were cicuta, salamandra, aconitus, pithyocampe, buprestis, mandragora, and cantharides; but in the time of Zacchias many metallic poisons were superadded.

evidence, which begins and ends with the sequence of probabilities. Science was, in fact, incapable of advancing the interests of society by conferring on the physician the resource of effective antidotes, although they were foreshadowed in the suggestion, that one poison might expel another; neither were the interests of human justice satisfied by the acquisition of such confirmatory evidence of fact, to support suspicion, which infallible tests alone can supply.

We shudder at the thought of the many crimes of poisoning which were then committed and passed unpunished, as well as of the immense number of individuals legally innocent of the crime laid to their charge, on whom the sentence of the law was carried into effect. As we proceed, it will be our duty to revert to this subject, and to inquire how far the detective power of the physician has kept pace with the ingenuity of criminals.

The work of Zacchias was a starting-point in a most important branch of our science, and it is only to be regretted that its author was so deeply imbued with all the prejudices of his contemporaries; for their logic had its illusions as well as their superstitions, and many a fallacy lurked in their syllogisms as well as in their divinations.*

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* Zacchias confesses to the assistance which he conceived might be derived from astrology. "Astronomia," says he, "porro multo plura promittit, et ars divinatoria dicitur, et ad Prophetiæ naturam accederet, si quicquid artifices sibi promittunt assequerentur: ex superiorum enim corporum ac Sphærarum motu, et Planetarum cæterorumque syderum malo aut bono aspectu inter se, ipsorumque loco et positurâ, et ex mille aliis circumstantiis, non modo ea, quæ ex quâdam naturæ proprietate quasi ex necessitate hominibus eveniunt, ut morbos et interitus, aliosque casus, sed etiam ea, quæ ex

When pestilential diseases cut off a great proportion of the inhabitants of Europe and Asia, and broke the ties of social intercourse*; when priests withdrew themselves through fear, and left the performance of their ecclesiastical duties to the few who were courageous and faithful enough to perform them†; when the inmates of nunneries belied their profession of charity, and closed their gates to protect themselves from the contagious poison‡; physicians, as a body, have been found to conduct themselves nobly, and to obey the instinct, which appears to be engendered by the study of medicine, of watching the phenomena of disease, regardless of all danger.

Exceptions, it is true, are recorded, as we have had occasion to observe in the conduct of Galen; and of the Arabian physicians, who ventured to justify their flight from infection, when their remedies were unavailing in the frightful epidemics which they were called upon to deal with. But the reported instances of such pusillanimous conduct are exceedingly rare; whilst we read of innumerable examples, like those of Gentilis de Foligno and Guy de Chaulliac, where medical practitioners have fallen, sacrifices to disease, in the faithful discharge of their sacred duty, even when they must have felt themselves utterly powerless in coping with those "great murrains" for which the sixteenth century is notorious.

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ipsa volubili hominum voluntate, et ex incertissimo eventu dependentiam habent, prædicere, ac certo præmonstrare, ex arte promittunt."—Lib. iv. tit. 1.

* Hecker's Epidemics of the Middle Ages, by Dr. Babington, pp. 47, 48.

† Ibid. p. 49; see also Guillelm de Nangis, p. 110.

‡ Ibid. p. 55; see also Chalin, p. 48.

Scarcely a year passed without some new form of malignant disease being described.*

It is probable, however, that the list may appear the more formidable in consequence of a general determination to revise and verify the observations of former writers. Partly also is it attributable to the fact, that physicians became awakened to a sense of the responsibility which attached to them on the revival of Letters.

Each of these motives may have influenced the labours of Victor Trincavelli, who, by birth and education, would be likely to be biassed by such considerations.

Born of a noble family in Venice, A. D. 1496, he distinguished himself in early life by his knowledge in Greek literature as well as in general philosophy; and succeeded Foscarini in the chair of philosophy; but pursued the study of medicine notwithstanding. The fame of the university of Padua attracted him, and thither he repaired to complete his medical education; there also was he capped as doctor of medicine.

On the outbreak of a pestilential fever in the island of Murano, he went there; and, by a chivalrous devotion to the relief of the sufferers, he gained so high a reputation, that on his return to his native city he was greeted with a perfect ovation. He was at once admitted to the College of Physicians of that town, and selected to succeed J. B. Monti in the chair of medicine at Padua.

He greatly reformed that school by introducing the study of Hippocrates, and became himself one of the most distinguished physicians of the sixteenth century. He died in 1568, a martyr to his profession, and his obsequies were celebrated with great splendour at the expense of the state, so highly was he esteemed by the public. He published a work on the "Practice of Medicine," and another on "Materia Medica;" but his "Consilia Medica" is the work by which he is best known, and from which the practice of the period when he wrote may be gathered.*

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* See Appendix, No. I.

A very similar career was observed in Franciscus Valleriola, a contemporary of Trincavelli.

Born of a distinguished and affluent family in Montpellier, he was educated with great care in that city, and proceeded to Paris for the purpose of obtaining a complete knowledge of the philosophy of his time. He returned to Montpellier to study medicine, and settled at Valence, where he practised so successfully that he soon acquired a great reputation for professional knowledge.

In the year 1544, a severe epidemic appeared at Arles, and Valleriola was invited by the chief magistrate and citizens of that town to superintend the treatment of the disease. This duty he undertook, and performed it with so much assiduity, that he was ennobled for his services, and subsequently elected to succeed Argentier in the chair of medicine at the university of Turin.†

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* "Victoris Trincavelli Consilia Medica, Epistolæ, et Tractatus de Reactione, de Venæ sectione et de Febre pestilente." The letters are addressed to various medical friends, and are explanatory of different natural phenomena, as well as of the causes of disease. The several theories, both in medicine and physiology, are made apparent therein.

† "Biographie Universelle," art. "Trincavelli." In this epidemic fever, Valleriola's chief remedy appears to have been the celebrated nostrum of which we have already spoken in an early part of this volume as the Mithridaticum. In 1591 this remedy became the subject of dispute between the professors of Padua: Sassonia advo-

Trincavelli and Valleriola have been selected as types of many physicians who published reports of individual cases, and monographs of particular diseases.

This became the habit, and it is regarded as the great characteristic of the latter part of the fifteenth and the whole of the sixteenth centuries. Hippocrates had, indeed, recorded cases before them, but the practice ceased with him. Trincavelli and Valleriola, however, embellished their reports with so redundant an erudition, that, in the works of either, the bibliomaniac appears to the mind of the reader, rather than the man of careful observation and absolute truth.

In Trincavelli's "Consilia," symptoms are chiefly dwelt upon, and obviously amplified, for the purpose of exaggerating the character and intensity of the disease. So also in the "Enarrationes" of Valleriola*, the cases are so highly coloured for the purpose of increasing the marvel of the cure, that we are, in both instances, irresistibly led to the inference that they were not faithfully and honestly reported.

But, as Dr. Bostock has remarked, "they served the purpose of inducing a habit of observation, and of directing the attention more to facts than to mere hypotheses. In each succeeding age, we find this plan to have been more generally adopted, and, at the same time, to have been much improved in its method; so that we may undoubtedly consider it as one of the means by which medical knowledge has advanced so rapidly in modern times."†

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cating its use, together with that of blisters, in plague; whilst Fabricius Campolongo, Bottoni, and Massaria were opposed to it. Sprengel, vol. iii. p. 117.

* Enarrationes Medicinales et Responsiones. Lugduni, 1589.

† Bostock's History of Medicine, chap. vii.

Much in the same spirit as did each of the above authors comment on a variety of diseases, was each separate disease which then prevailed commented on by a variety of authors; and we may form a tolerably accurate judgment of the range and gravity of such epidemics by the number of writers who employed their time and talents in the description of them.

The plague of course, from its frequent recurrence and terrific fatality, forced itself upon the attention of physicians more, perhaps, than any other disease: some attributing it to a general atmospheric influence, whilst others, amongst whom we find Ambroise Paré, observing that it sometimes appeared in the finest, as well as in the most inclement seasons, but mostly, if not always, in conjunction with some local and adequate cause, therefore, thought it was due to some local corruption of the air. In every outbreak of the pestilence there was scope, as there always is on the appearance of every epidemic, for a great diversity of opinion.

Thus it was that Syphilis came to be the subject of so many monographs, and that learned men like Gaddesden and Gordonius saw in the disorder that which they supposed had been imperfectly described as Lepra by the Greeks and Arabs; and we can readily imagine that the eruptions which they observed, as developed under the influence of the venereal infection, were calculated to deceive more experienced men; nor was it until, one by one, the distinguishing characteristics of the new disease were described*, that they were generally accepted as such.

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* Massa indicated the corona veneris; Torella first directed attention to the size of the patches of eruption; whilst Fallopius

The difficulty was the greater, too, in consequence of one common term "Leprosy" having been indiscriminately applied to the different forms of elephantiasis of the Greeks and scaly-lepra of the Arabs, "as well as to every other form of chronic skin-disease, which was bad enough to entitle the subject of it to admission to the lazar-houses which were established over Europe, where the indigent were glad to get the subsistence they provided at the expense of being called lepers."*

The confusion in these cases is manifestly attributable to an inefficient discrimination of the essential features of each individual affection.

But in another scourge, which has probably destroyed more individuals than all the various accidents incidental to a maritime life, including naval warfare, it has been urged that the same kind of confusion, though less in degree, has arisen from a desire on the part of some learned men who have written on the subject, to identify it with a class of ailments to which it does not rightly belong.†

In 1497 Scorbutus, or scurvy, was the acknowledged cause of the dreadful havoc in the crew of Vasco de Gama, during a voyage of discovery round the Cape of Good Hope.

Its destructive ravages continued for some time after, and the disease was made the occasion of many monographs, the earliest of which was by Krantz, the Saxon historian, who called it scurvy. His was followed by

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pointed out the characteristic colour of syphilitic eruptions. "Encyclographie des Sciences Médicales," art. "Syphilides," par Alp. Cazenave, tom. xxix. p. 235.

* Cyclopædia of Practical Medicine, art. "Lepra," by Dr. Houghton, vol. iii. p. 26.

† Sprengel, vol. iii. p. 78.

many others*, the chief of which were collected and published by Daniel Sennertus in 1654.

Considerable discrepancy of opinion has prevailed relative to the origin of scurvy; but it seems highly probable that it existed at a very remote period of time in Northern Europe; and the fact that no mention was made of it, may be accounted for by the extreme ignorance of people in matters appertaining to medicine. It is only in cases where historians themselves have been the subjects of disease that we obtain from them such graphic and unequivocal narratives as that of Thucydides concerning the plague of Athens, or as that of the Sire de Joinville relative to the outbreak of scorbutus in the army of Charles IX.† It is also probable that some diversity may have been manifested in the phenomena of the disease at different periods, in consequence of the variety of circumstances under which it has appeared; and that other forms of distempers may have been taken for it is very likely, seeing that the petechial fever of 1506 bore a striking resemblance to it. As lately as the beginning of the present century, a dissertation was written on the analogy of scorbutus with adynamic or putrid fever.‡

Jacques Cartier, who sailed from St. Malo in May 1535, with 110 men, to explore the coast of Newfoundland, and the river St. Lawrence, which he discovered, gives a most expressive account of an irruption of scurvy amongst his crew at Stadacona; and attributes it to infection from the natives, who were suffering from it.

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* The principal tracts on Scorbutus were by Balduinus Ronsseus, Johannis Echtius, Johannis Wierus, Johannis Langius, Salomon Albertus, and Matthæus Martinus. All these tracts were combined in one volume, and published by Sennertus. He derives its name from the Saxon *schorbock*, or *scorbuck*, or *schurmundt*, which point to the affection of the mouth as the principal feature of the disease.

† See pp. 196, 197.

‡ Dissertation sur l'Analogie du Scorbut avec la Fièvre Adynamique (putride), par C. L. Jourdanat. Paris, 1802.

The disorder spread so rapidly, that in six weeks eight of his men had died, and ten only remained free. At the expiration of six weeks more (March 1536), twenty-five had died, and three only, including the captain, continued sound. Then, says Cartier, "it pleased God to cast his pitifull eye upon us, and sent us the knowledge of remedie of our healthes and recoverie."

This he learned from a native, who informed him of "the juice and sappe of the leaves of a certaine tree" with which he had healed himself, and he informed Cartier that "the vertue of the tree was to heal any other disease."

The tree they called the Ameda or Hanneda, which was thought to be the sassafras.

The good effects of the remedy were quickly visible, and, as if to give his testimony to the truth of what had been told him, Cartier adds, "there were some had been diseased and troubled with the '*Morbus Gallicus*' foure or five yeares, and with this drinke were clean healed. If all the physicians of Montpellier and Lovaine had been there, with all the drugs of Alexandria, they would not have done so much good in one yeare, as that tree did in six days, for it did so prevail, that as many as used of it, by the grace of God recovered their healthe." *

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* Hakluyt's Collection of Voyages, vol. iii. p. 280. Lond. 1810.

Cartier's narrative is so graphic, that a condensed form of it may be interesting to the reader. "The said unknowen sicknes," says

The earliest notice which we possess of lemon juice as a remedy is contained in the third epistle of Ronsseus, dated 1564, wherein it appears that some Dutch sailors who were suffering from scurvy, and the cargo of whose ship, on their return from Spain, consisted of lemons and oranges, accidentally discovered that their use was the means by which they recovered their health.

Now although scorbutus is one of the affections in which the sufferer is apparently directed by a sort of instinct to the means of cure, yet was the remedy which proved so beneficial to Cartier's men, and that also discovered by the Dutch crew in 1564, acquired by perfect accident, as many of the most valuable hygienic means have been, which we are too apt to

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his translator, " began to spread itselfe amongst us after the strangest sort that ever was eyther heard of or seene, insomuch as some did lose all their strength, and could not stand on their feete, then did their legges swel, their sinnowes shrinke as blacke as any cole. Others also had all their skins spotted with spots of blood of a purple colour: then did it ascend up to their ankels, knees, thighes, shoulders, armes, and necke; their mouth became stincking, their gummes so rotten, that all the flesh did fall off, even to the roots of the teeth, which did also almost all fall out. On the death of one Philip Rougemont, aged twenty-two, because the sicknesse was to us unknowen, our captaine caused him to be ripped, to see if by any meanes possible we might know what it was, and so seeke meanes to save and preserve the rest of the company. He was found to have his heart white, but rotten, and more than a quart of red water about it; his liver was indifferent faire, but his lungs blacke and mortified; his blood was altogether shrunke about the heart, so that when he was opened, great quantitie of rotten blood issued out from about his heart; his milt towards the backe was somewhat perished, rough as if it had been rubbed against a stone. Moreover, because one of his thighs was very blacke without, it was opened, but within it was whole and sound. That done, as well as we could, he was buried."

boast of as inestimable blessings conferred by *science* upon mankind.

But for the reasons above assigned, we should undoubtedly possess many other records of the devastations of this scourge during the middle ages; for the dried and salted provisions which were used throughout winter as the chief articles of food by most northern nations, our own amongst the rest, combined with a cold and damp climate, were the predisposing causes which, we now know, exert the greatest influence in the production of the disease.

The miserable deficiency of fresh vegetables in the sixteenth century is shown by the historical fact that it was not till the end of the reign of Henry VIII. "that any salads, carrots, turnips, or other edible roots, were produced in England. The little of these vegetables that was used was formerly imported from Holland and Flanders. Queen Catherine, when she wanted a salad, was obliged to despatch a messenger thither on purpose." *

The method of tracing disorders to their terminations, and in fatal cases to the tissues involved in the diseases, was the means of superadding to the knowledge of healthy anatomy the cognizance of those peculiar changes of structure which, as connected with the respective distempers produced by them, constitutes the science of pathological anatomy.

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* Hume's "History of England," chap. xxxiii. At a still later period (during the reign of Elizabeth), a Mr. John Gerard, famous for his knowledge of botany, reared and naturalised many plants and vegetables in a large "physick garden near his house in Holbourn," when potherbs, such as cauliflowers, cabbages, &c., were brought from Holland, cherries and quinces from Flanders, apples from France, hops from the Low Countries, small nuts from Spain, and chestnuts from Portugal. But in consequence of the efforts of Gerard, our ancestors' tables soon ceased to be supplied by such foreign commerce, and it was discovered that cherries, apples, pears, hops, and cabbage could be grown better in England than in any other part of the world. "Biographia Britannica," vol. ii. pp. 1023, 1024.

The advantages to be derived from such a collateral source of information were clearly seen and rightly appreciated by Eustachius, who became one of the earliest and most earnest advocates of *post mortem* examinations. He represented to the magistracy the benefit likely to accrue from an investigation of all persons dying of occult diseases, to the end that the treatment of such affections might be improved.*

One of the first and most germane effects of these researches was the acquisition of a more correct notion of the precise function of each individual organ than had been previously entertained; and consequently a more comprehensive idea of the significance of symptoms, as resulting from the disturbance of those functions. Hence the sudden aspect of a new branch of medical science (*semeiology*), which has for its object the determination of the value of those particular phenomena which present themselves in the course of disease.

Hippocrates, it is true, founded a system of Prognostics from isolated observations made upon the sick, and recorded on the votive tablets in the Asclepion of Cos. But although he repudiated all existing theories derived from the systems of philosophy which prevailed when he lived, and based his inductions on pure observation, yet, as Dr. Ermerius has remarked in relation to the book on Prognostics, "All attests the infancy of the art; many things are imperfect, and not unfrequently do we see him, while in pursuit of truth, groping, as it were, and proceeding with uncertain steps, like men wandering about in darkness." *

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* Bostock's History of Medicine, chap. vii.

Such, however, was the system which Aristotle and Galen accepted, but which dwindled and well-nigh died out, like every thing else in the shape of rational medicine, during the early and middle ages.

It is only by taking into consideration such decadency that we can comprehend the possibility of works like that of Culpeper on Semeiology †, wherein he takes credit to himself for "disclosing the rarest and deepest mysteries of Physick, till then lockt up and concealed in unknown languages, and the determination of critical days, by a figure of eight or sixteen heavenly houses."

By degrees the new system of natural semeiology (for new it virtually was) gained over the assent of physicians, whose writings disclose a gradual change from dependence on the arbitrary dogmas of Hippocrates and Galen, to the more rational procedure of founding prognosis on correlative indications.

One of the earliest evidences of this transition may be observed in the treatise of Edguardus ‡, who was physician to Henry, Duke of Richmond, in 1532, wherein he refers chiefly to the prognosis of Galen, but speculates on the condition of the internal organs, from the appearance of the excrementitious discharges.

But Savonarola has generally the credit of having

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* Specimen Historico-Medicum Inaugurale de Hippocratis Doctrinâ à Prognostico oriundâ. Lugduni Batavorum, 1832. See also The Genuine Works of Hippocrates, by Francis Adams, LL.D. vol. i. p. 226. Printed for the Sydenham Society.

† Semeiotica Uranica; or, an Astrological Judgment of Diseases, from the Decumbiture of the Sick. By Nicholas Culpeper.

‡ De Indiciis et Præcognitionibus, Opus apprimè utile Medicis, Davido Edguardo, Anglo, Autore. 1532.

created this new and important handmaid to the healing art; and his book on the subject, especially that part of it which treats of the evidence to be derived from the pulse, and from the renal secretion, may be read at the present day with great advantage, so marvellously sagacious are many of the remarks. Most of his prognostic signs (*signa prognostica*), which appear in fevers, he quotes from Hippocrates, Aristotle, Galen, and Avicenna; but in both subjects to which I have referred, although he reasons on wrong data, his conclusions are correct.*

In 1596 Jacobus Albertus published his treatise on prognosis† and diagnosis, and it is wonderful how evidently he availed himself of the knowledge conferred by the anatomists of the sixteenth century to detect a diseased organ, as well as to supply a rational prognosis.

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* "Practica Canonica," Joannis Michaëlis Savonarola, Lugduni, 1560. He starts with the following proposition on the pulse: "Quod pulsus est motus receptaculorum generalium: spiritus cordis scilicet et arteriarum, ex diastole et systole compositus, a virtute vitali completus, spiritûs sive caloris naturalis per aerem attractum et per ipsum inutilem expulsum regitivus. Nam diastole attractione, et systole expulsione completur; attrahitur enim aer frigidus utilis in cordis refrigerium ac caloris, et calidus nocivus cum capnosis fumis in ejus mundificationem expellitur, et ut Galen quidem innuit, calorem innatum eventari per id sicut eventatur ignis per flabellum et stringitur ejus accensio eventatione, et æquatur complexio ejus. Quibus colligitur notum, hunc quem pulsum nominamus duplici motu esse fulcitum, duplicique quiete; sicque ipsius partem essentialem esse, qui sic pulsus dictus est: quoniam in elevatione arteriæ ad digitos pulsare videtur." He speaks of the urine as the superfluous fluid of the hepatic veins, generated with the blood, and expelled from it by the emulgent veins, and bearing with it indications of the nature of the blood, and consequently of the body.

† "ΣΗΜΕΙΩΤΙΚΗ, sive Ratio Dignoscendarum sedium male affectarum, et affectuum præter naturam, Auberto Jacobo." In this work he boldly begins with the proposition, "Ab actione læsâ membrum male affectum cognosci."

Coyter and Donatus, like Eustachius, impressed upon the minds of the magistrates, the importance of examining the dead, and the contributions which were made to pathological anatomy, in consequence of the facilities thus given for such observations, destroyed very many errors which were entertained on the authority of Galen*, and occasioned the reports of Tornamira on renal concretions as well as the cases recorded by Vesalius and Fallopius.

This phase of medical history is well worth studying, if it be but to trace the various expedients which were caught at, to establish an indubious foundation for diagnosis and prognosis.

As long as these expedients were derived from pathological anatomy, and the functional disturbances dependent thereon, the nature of which were, in some degree, understood and appreciated, the practice of medicine was in the best possible condition to be improved; but when uroscopy and the doctrine of the pulse (*ars sphygmica*) were relied on for determining the nature and probable issue of disease, we can well estimate the solicitude of physicians in their *gropings* after truth.

Still more vague and fanciful were the notions of those who espoused the old Platonic superstition of numbers, as potential entities in controlling the course of disease. Yet some there were, men of no great note it is true, who attributed to the seventh, fourteenth, and twenty-first days the character of turning points, or critical periods, rather as pertaining to the number seven, than as relating to the nature of the distemper. Jerome Cardan was most ingenious in this respect, dividing and multiplying the days of the year until he attained a number derived from seven; for which very unintelligible reason he invested the seventh day with a peculiar virtue; and Amatus Lusitanus, of Portugal, shared in the belief. With something more of a reason, Augustin Nisso, in his work on the subject, explained the influence of critical days on astronomical data, and gained many proselytes to his doctrine.

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* Sprengel, vol. iii. p. 141.

The renal secretion has, at all times, commanded a considerable share of attention among medical practitioners. It was a favourite means by which the Saracenic physicians arrived at their prognosis, and it was very generally used for the same object in the sixteenth century, when many works on uroscopy were written; those by Binder, Sylvianus, Vallesius, and Fabricius being the principal. In Germany, it was so entirely depended on, that it was the duty of the court physician to inspect the royal secretion every morning. But, when we consider the complex nature of the urine, the ready manner in which its constituent parts undergo mutual decomposition, and the fact, too, that absolutely nothing was known of the true chemical constitution of that fluid, we can only marvel at the accurate observations recorded in the "Prognostikon" of Hippocrates, the treatise on "Crises" by Galen, and the other works above alluded to.

Others regarded the pulse as the absolute guide to a correct prognosis, and a long controversy was maintained between the champions of uroscopy, and those of the *ars sphygmica*[*]; but the knowledge derived from both was so entirely empirical, and the hypothetical use of the pulse so essentially erroneous[†], that nothing but the most faithful observation, and truthful record of facts, can account for the favourable influence which the above doctrines exercised on the practice of physic.

As great an impetus was given to surgery as to medicine by the researches of the anatomists; for up to the sixteenth century Albucasis and Guy de Chauliac continued to be revered as the infallible authorities of the art; and, with the imperfect knowledge of the human structure which was possessed up to that period, it is not surprising that all important operations were undertaken with great dread by surgeons, and followed, in a very large proportion of cases, by fatal results to the patients.

We have seen, for instance, how the Norsini family of Milan, and the Colots in France, acquired fame from their operations for stone; and how, immediately after Montagnana published his work on anatomy, the operation was made more simple and less fatal. Eventually the exclusive performance of it was destroyed by Johannis de Romani and Marianus Sanctus.

The fallacious idea, too, that gun-shot wounds were poisonous, was one of the earliest to be dispelled by Paré and Maggius of Bologna. Paré, it is true, stumbled on the truth by a lucky accident; but Maggius dispelled the error by showing that the elementary parts of powder were not poisonous, and that the ball, not being hot, could neither burn nor poison*; whereupon he suggested a more rational practice, which Paré adopted and carried out.

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[*] The principal writers on the pulse during the sixteenth century were Ægidius, Clementinus, Clausa, Cordus, Struthius, Botal, and Mercatus.

[†] The Galenic dogma of the use of the pulse, which was supposed to be to maintain the heat of the body, and to remove the excess of excrementitious matter from the blood, was still believed in.

Both theory and practice were accepted by the chief surgeons of that period; and, accordingly, we find Carcano Leone, professor of surgery at Pavia, Felix Wurz in Germany, Ranchin at Montpellier, and Guillemeau in Paris, established the more rational treatment of gun-shot wounds.

Surgeons were no longer concentrated in one country; for, wherever anatomical knowledge extended, there an improved system of surgery was sure to follow; so that, as Portal has remarked†, wherever a surgical chair was established, a celebrated professor was at hand to occupy it.

In Italy, as may be inferred from the subjoined list‡, the most distinguished surgeons abounded; whilst in France, where there was no lack of able men, the old bickerings which we have recorded between the *Chirurgiens de Robe Longue*, or the Collége de Saint Côme, and the *Chirurgiens de Robe Courte*, or the barber-surgeons, of whom Paré was the illustrious chief, still continued. These squabbles appear to have been rather excited than discouraged by the members of the faculty of medicine, who viewed with jealousy the enactments which had established the College of Surgeons a part of the University*, and the pretensions of its members to receive the benediction of the Chancellor; hence the physicians have been accused of affecting to extend the hand of friendship to the weaker body, the more effectually to keep down both.†

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* "De Sclopetorum et Bombardarum Vulnerum Curatione Liber." Bononiæ, 1552. On this subject it is curious and interesting to read some arguments which have been used to sustain one fallacy by means of another. Ferri, for instance, a surgeon of some repute at Naples, maintained that gun-shot wounds must necessarily be poisonous, because the very wind of balls is sometimes as fatal as the balls themselves, in consequence of the venomous vapours which they carry with them. See Ferri, "Sclopetor. Vulnerum," p. 988.

† Portal, vol. ii. p. 1.

‡ The principal surgeons in Italy during the sixteenth century were Jean de Vigo, Marianus, Blondus, Bologninus, Maggius, Ferrius, Rota, Varolius, Andreas à Cruce, Ferrara, Boschus, Montagnana, Gavasseti, and Tagliacozio. In France the most celebrated were Tagault, Houllier, Franco, Chaumet, Gourmelin, Joubert, Innocent, Pinneau, Paré, Pigray, and Guillemeau. In Spain, Fragoso, Arcæus, Leon, Alcasar, and Mercado, who was also famous as a phy-

In Germany, where the alliance of surgeons with barbers existed as it did in other countries, the school of surgery was still in its infancy, although in advance of the rest of Northern Europe. Surgeons were held in low estimation by the public, probably in consequence of the above relationship; for it was considered a disgrace to have descended from a barber.‡

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sician. Amatus Lusitanus flourished and acquired great renown in Portugal; Fienus and Forest in Holland; Langius, Wurzius, Barlish, and Jordan in Germany; Ruef in Switzerland; and Thomas Vicary in England.

* Girodat, p. 210.

† Ibid. p. 183.

‡ It is a curious fact that surgery should have been so much neglected in Germany, seeing that there were many sources of education open to the German students. As early as the thirteenth century the Universities of Prague and Vienna were established; and in the fifteenth, the Universities of Erfurt, Leipzig, Ingolstadt, Tubingen, Louvain, and Upsal were founded and endowed. According to Meiners, there were 4000 teachers and students in Prague in 1409. The University of Leipzig was very popular from its beginning; and at Louvain in 1570 there were 8000 students. Yet

With a few words on one more individual, we may bring this part of our subject to a conclusion. We have already alluded to Vincent Vianeus, who first practised the art of restoring lost noses and lips by means of portions of flesh, which he transplanted from the arms of his patients; so that he was, in fact, the originator of plastic surgery.

In the sixteenth century Gaspar Tagliacozio, or, as he is better known in this country, Taliacotius, a professor of surgery at Bologna, resumed the operation of Vianeus, and so popular did it become, that Ranchin and Paré refer to it with approbation. In a most ingenious manner, Taliacotius prepared the skin of the fore-arm of his patient, and engrafted it on the seat of the old nose; but this form of operation has been superseded by what is called the Indian method, which consists in taking the skin from the forehead.

For this operation, however, a statue was erected to the memory of the Italian surgeon in the amphitheatre at Bologna, which represents him with a nose in his hand.

The operation gave rise to a somewhat indecorous verse in Butler's poem of Hudibras*, in consequence of an anecdote of Van Helmont to show the influence of sympathy. A gentleman at Brussels, he says, had a new nose made for him by Taliacotius from the arm of a Bolognese porter; and about thirteen months afterwards, as he was walking in Brussels, the nose suddenly

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it appears that the great seat of learning was Italy; for we are informed that so late as 1564 there were 200 German students at the University of Padua. See "Geschichte der Entstehung und Entwickelung der hohen Schulen unsers Erdtheils, von C. Meiners." Göttingen, 1802.

[*] Canto i. lines 281–286.

became cold, and dropped off, at the very instant at which the porter died in Bologna.

Unfortunately for the anecdote, Taliacotius never attempted to transfer the skin of one man to the body of another; but took it from the arm of his patient, which he applied and fixed to the face by means of a particular dress, as represented in the sixth and fourteenth plates of his work*: the manner of fixing it is represented in the eighth, ninth, and seventeenth plates; and his instruments in the twelfth and thirteenth.

Nevertheless, Irvyng, an English writer, testifies to the truth of Van Helmont's anecdote by asserting that he had "heard it from a doctor of physick, a friend of his, who did swear it deeply, that himself was an eye-witness of it."†

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* Taliacotius (Gaspar), Cheirurgia nova de Narium, Aurium, Labiorumque Defectu per insitionem cutis ex humero sarciendo. Francof. 1598.

† Medicina Magnetica; or, the rare and wonderful Art of curing by Sympathy. C. de Iryngio, Chirurgo Medicine in the Armie. 1656.

CHAP. XII.

MEDICINE AND SURGERY IN ENGLAND DURING THE SIXTEENTH CENTURY.—ROSICRUCIANS.

Until the reign of Henry VIII., the powers of the clergy over the medical profession were formally recognised by parliamentary enactments, and it was no unusual thing to see a doctor of divinity perform the duties appertaining to a physician. Nor was this relationship between orthodox Christianity and medical skill repudiated by Henry himself until the year 1518.

In the Parliament which assembled on the 4th of February, 1512, an act was passed, prohibiting, under a penalty of five pounds per month, any person to practise physic or surgery in or within seven miles of London, unless approved by the Bishop of London or the Dean of St. Paul's and four Doctors of Physic or expert surgeons, or in any other part of England, unless approved by the bishop of the diocese or his vicar-general.*

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* Stat. 3 Henry VIII. c. 11. The following is the preamble to the act by which the Parliament of Henry VIII., in the third year of his reign, conferred the supreme function and jurisdiction of the bishops, as the chiefs of the faculty of medicine:—

"Forasmuch as the science and cunning of physick and surgery (to the perfect knowledge whereof be requisite both great learning and ripe experience) is daily within this realm exercised by a great multitude of ignorant persons, of whom the greater part have no man-

The last clause ordained that this decree should not be prejudicial to either of the universities of Oxford or Cambridge, and that surgeons should be comprised in the act as physicians, to protect them from the mischief of ignorant persons presuming to exercise surgery.

The above statute continued in force until the 14th and 15th of the same king's reign, at which period the charter granted in the tenth year of the same (1518) by the intercession of Cardinal Wolsey and six eminent physicians, three of whom belonged to the king's own person, was confirmed by an act of parliament.

From that time the practice of physic in England passed from the hands of the priesthood and became an independent profession, although the Archbishop of Canterbury still retains the power of conferring medical degrees, and exercised the prerogative in 1827.*

The charter, together with the privileges specified therein, have been already described, and I have now

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ner of insight in the same, nor in any other kind of learning: some also can no letters on the book, so far forth that common artificers, as smiths, weavers, and women, boldly and accustomably take upon them great cures and things of great difficulty; in the which they partly use sorcery and witchcraft, partly apply such medicines unto the disease as be very noisous and nothing meet therefore, to the high displeasure of God, great infamy to the faculty, and the grievous hurt, damage, and destruction of many of the king's liege people, more especially of them that cannot discern the uncunning from the cunning." It was therefore by the authority of that Parliament enacted, "That no person within the City of London, nor within seven miles of the same, should take upon him to exercise and occupy as a physician or surgeon, except he be first examined, approved, and admitted by the Bishop of London or the Dean of Paul's for the time being, calling to him or them four doctors of physick, and for surgery other expert persons in that faculty," &c.

* In 1827 Sir Charles Clarke received his degree of M.D. from the palace of Lambeth.

only to show how the authority, which has such immediate reference to the present condition of the English physician, has been carried into execution.

At the very beginning, however, we are met by the difficulty of obtaining authentic information, in consequence of the destruction, by fire, of the earliest annals of the college. But the loss was supplied so far as his memory would serve him, by Caius of whom we have already spoken, as having received his early education at Gonville Hall, Cambridge, studied medicine at Padua, and received his doctor's degree at Bologna.

According to the fashion of his day, he went abroad in pursuit of knowledge; and when only a student he is said to have read lectures on the works of Aristotle in the university of Padua, where he resided with Vesalius some eight or nine months; during which time he devoted himself assiduously to the study of his celebrated companion.* On his return to this country he was admitted doctor of medicine at Cambridge, and after practising a short time at Shrewsbury and Norwich, he was summoned by Henry VIII. to deliver anatomical lectures to the surgeons in their own hall, very shortly after their incorporation in 1540.†

In 1547 Caius was admitted a Fellow of the College of Physicians; he next passed through the several offices of consiliarius, censor, registrar, and treasurer, and in 1555 was elected president; an appointment which he held upwards of seven successive years.‡

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* Gold-Headed Cane, p. 91.

† Ibid.

‡ "Annales a Collegio condito ac constituto Jo. Caio." "Caius enjoyed the dignity of court physician during the three successive reigns of Edward VI., Mary, and Elizabeth. Being in great favour with Mary, he obtained from her majesty a licence to advance Gon-

He was a staunch defender of the college rights and privileges whenever a question was raised concerning them, and in all proceedings against empirics and unlicensed individuals, no doubt whatever can be entertained of his unceasing energy in the discharge of his duties.

The authority of the college had manifestly been exercised before, for we read in the "Annals," that in 1543, under the presidency of Edward Wotton, two men, named John Wisdam and John Lyster, were sued for practising physic against the statutes of the realm, and judgment was given against them.* In the same year, the decrees of the college, relating to the morality and honourable conduct of its fellows and licentiates, were read in public. We may infer also, that the

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ville Hall into a college, which he endowed with several estates for the maintenance of three fellows and twenty scholars (1557), and his name still gives the title to the college. He died in 1573, aged sixty-three years, and on his monument is the laconic inscription, 'Fui Caius.'"—*Lives of British Physicians, Family Library.*

* In Dr. Goodall's "Historical Account of the Royal College of Physicians" (p. 306) we have the following narrative: "In the fourth year of King Edward VI.'s reign, in the month of September, one Grig, a poulterer of Surrey (taken among the people for a prophet in curing of divers diseases by words and prayers, &c.), was, by command of the Earl of Warwick and others of the council, set on a scaffold in the town of Croidon, in Surrey, with a paper on his breast, wherein was written his deceitfull and hypocritical dealings; and after that, on the eighth of September, set on a pillory in Southwark, being then our Lady fair there kept, and the mayor of London, with his brethren the aldermen, riding through the fair, the said Grig asked them and all the citizens forgiveness."

"Of the like counterfeit physician (saith Stow) have I noted to be set on horseback, his face to the horse-tail, the same tail in his hand as a bridle, a collar of jordans about his neck, a whetstone on his breast, and so led through the city of London, with ringing of basons, and banished."

power to examine drugs in apothecaries' shops was duly exerted, seeing that bad medicines were condemned to be burnt, in presence of the censors, in the market-place (*aperto foro*) of Westminster. It was moreover ordained, probably in conformity with the lingering influence of the clergy, that the fellows should receive the sacrament three times, at least, in every year.

But, no sooner was Caius president, than we find several "practisers of physick" were examined by the college, and found so unfit for the practice of the art, that they were rejected. Many empirics were admonished, fined, and imprisoned [*]; and, the more effectually to carry out the provisions of the charter, Caius addressed an appeal to justices, mayors, sheriffs, bailiffs, constables, and others, exhorting them to commit to prison offenders against the college laws; "men who were wandrying about the country with chaungeable names and false medicines, to the gret abus, deceyte of the kynge's people, and losse of goods and lyves of the same." [†]

In the year 1555, the University of Oxford was reproved in a letter from Caius, to which the common seal of the college was attached, for having conferred on Simon de Ludford, a seller of drugs, and David Lawton, a coppersmith, the degree of bachelor of medicine; both having been rejected by the censors of the college in 1552, and Lawton a second time in May 1555. [‡] Hereupon a warm discussion ensued, the College of Physicians justly feeling itself aggrieved in that two ignorant men had been partially removed from its jurisdiction by being admitted graduates of Oxford. In the following year it was resolved, and approved by the Chancellor of the University, for the purpose of insuring an adequate amount of knowledge in all candidates for medical degrees, that they should be examined in Aristotle and Plato in philosophy, and in Hippocrates and Galen in medicine.

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[*] Annales, 20th May, 1555.

[†] The above appeal was drawn up pursuant to the acts of Parliament, and judgment of the most learned Rastal and Walpole, serjeants-at-law, and Sir Robert Brook, Lord Chief Justice of the Common Pleas. See Goodall, p. 309.

[‡] Page 271.

"Surgeons and apothecaries were prohibited the practising of physic; and the latter required that they should not divulge the names of medicines, nor deliver physicians' bills to the patients, they often proving of dangerous consequence to them."*

Queen Mary, in 1557, reverting to an act passed by Henry VIII., charging physicians to examine, yearly, the drugs of apothecaries, and to burn and destroy all such as they should find unwholesome and corrupt, confirmed that act, and gave additional power to the president, comitia, and fellows, for the purpose of preventing the indiscriminate sale of noxious drugs and poisons.†

In contemplating this state of things, it is necessary to remember that both surgeons and apothecaries were generally uneducated men. The former were incorporated with barbers by Henry VIII. in 1540, and the latter, who were generally grocers in England, as they were pastrycooks in France and Germany, were made one corporate body with grocers by James I., in the fourth year of his reign.‡

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* Goodall, p. 310.

† Vide Annals, p. 34; see also Goodall's Hist. pp. 311, 312.

‡ Goodall's Hist. pp. 20, 119. The surgeons, according to

But in reading the acts of incorporation, irrespective of any other evidence, it is obvious that, in both classes, there were men of preeminent talent. In the act "for barbers and surgeons," it is expressly stated, "forasmuch as within the city of London, where men of great experience, as well in speculation as in practice of the science and faculty of surgery, be abiding and inhabiting, and have more commonly the dayly exercise and experience of the same science of surgery than is had or used within any parts of this realm," &c. And the act of James especially signalises 114 of his "natural subjects," as learned in the faculty or mystery of pharmacy.

In the first act, moreover, the surgeon is distinguished from the barber, the latter being prohibited the use of a surgery for the letting of blood, or any other thing belonging to surgery (drawing of teeth only excepted); so also in the second act, are apothecaries made distinct, and separated from grocers, and a distinct clause is introduced, forbidding a grocer to keep an apothecary's shop.

The association therefore was precisely similar to that of a noble lord with a city guild at the present day, and just as congruous. But what concerns us most is the fact that the arts of surgery and pharmacy improved by slow degrees; partly in consequence of the strong common sense of the practitioners in these respective crafts, and partly in consequence of a higher tone and more extended course of education than had previously been adopted. Their interruptions were less frequent also by reason of acts passed in the fifth

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Dr. Andrews, associated themselves with barbers in England in 1506. See Dr. Henry's "History of England," vol. ii. p. 71.

and fourteenth years of Henry, exempting physicians and surgeons from bearing arms, serving on inquests, or juries, "because of the continual service and attendance that they daily and nightly, at all hours and times, gave to the king's liege people."

An additional source of knowledge was conferred by Elizabeth on physicians and surgeons in a "Charter for Anatomies," whereby it was decreed that all felons executed in the county of Middlesex were to be consigned to the president of the College of Physicians, for the purpose of advancing the science of medicine.

Great facilities were thus given to Caius, who, imbued with the spirit of inquiry which he had developed in Italy, added greatly to his own reputation by increasing that of the surgeons, to whom he continued to lecture for nearly twenty years.*

Curious enough, however, this very improvement of the surgeons engendered certain jealousies and bickerings on the part of the physicians, so that, in spite of the best intentions and highest motives, the frailty of human nature stepped in to mar the harmony which existed in a less auspicious state of things.

Thus, in the reign of Elizabeth, a dispute arose between the physicians and surgeons as to whether the latter might administer internal remedies in sciatica and various other similar diseases and wounds. Caius was summoned, as president of the college, to appear before the Lord Mayor and Queen's delegates, when he defended the college rights so learnedly, and so strenuously pointed out the illegality of the practice of the surgeons (though they were supported by the Bishop of London, the Master of the Rolls, and others), that it was unanimously agreed that it was unlawful for the surgeons so to practise.*

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* Gold-Headed Cane, p. 92.

This conduct not only made him notorious, but brought on him many enemies; and Shakspeare selected his name for the ridiculous French doctor in the comedy of the "Merry Wives of Windsor," in resentment for his excess of zeal.†

But he was not singular in his alacrity to uphold the honour and dignity of the profession, for the proceedings of the college generally against persons who infringed on the privileges, as well as against empirics who violated the laws, were numerous during the reign of Elizabeth.

It has been the fashion to make light of the erudition of the early members of the college, and to attribute to the pride of authority more than to the love of science the motive by which they were prompted to adjust professional affairs; to impute, in short, the appetite for persecution rather to selfishness or conceit than to the chivalrous spirit of advancing the general welfare of society.

If, however, the works of the English authors which have been quoted be referred to, it will be found that the writers were by no means so deficient in knowledge, however much they may have been in resources; and a brief notice of a few of the cases of proceedings against unqualified practitioners, will give a better idea of the manner in which medical aid was commonly administered, than any more general description; it will be made evident too that the incentive to appeal to the law in every case, was the safety and welfare of the queen's subjects, as well as the honour and prosperity of the profession.

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* Family Library, "Lives of British Physicians." Caius died in 1573. According to Dr. Andrews, towards the close of his life he was greatly teazed and perplexed concerning religious matters. Andrews's "History of England," vol. ii. p. 67.

† Family Library, "Lives of British Physicians."

Such was manifest in the prosecution of an Italian, named Sylva, who was first examined and rejected by the whole college, in consequence of his egregious ignorance, and he was subsequently fined and imprisoned for having killed one person, and inflicted "much apparent hurt to many other of the queen's subjects."*

Again, in the case of Margaret Kennix, in whose behalf a letter was sent, by the queen's command, from Sir Francis Walsingham, Secretary of State, signifying that it was her majesty's pleasure the poor woman should be permitted quietly to practise her small talent, and minister to the curing of diseases and wounds by means of certain simples, in the application whereof it was thought God had given her an especial knowledge to the benefit of the poorer sort, and chiefly for the better maintenance of her impotent husband, &c.

The president (Dr. Giffarde) and college replied: "That the especial knowledge referred to was a weakness and insufficiency rather to be pitied of all, than envied of them or maintained of others; and that as there ought to be no one thing more allowable in his honour's eyes than the preservation of wholesome laws, and the maintenance of good and laudable orders, but also the greatest ornament and beauty of a commonwealth; they were of opinion that the diligent care which they had, and were bound to have, over the health and life of her majesty's subjects, the dutiful regard they bore to the maintenance of their privileges, and the strait band of oath and conscience, were of greater weight than they could release themselves of at pleasure; and, therefore, most respectfully refused to suffer either her or any other unqualified persons to intrude themselves into so great and dangerous a vocation, not only against good order, privilege, and conscience, but also to the evident danger of the life and health of such of her majesty's most loving subjects as might be abused by their notorious and wilful ignorance."*

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* Goodall's History.

In the case of foreign physicians, and of Englishmen who had taken their degrees in foreign universities, it was enacted, that such men should incorporate in one of our own universities before they could be admitted as fellows of the college, so as to take a share in the government of it. They might, however, by undergoing an examination, practise as *permissi*, or licentiates, to the end that their talents might be used for their own advantage and the public good. Accordingly, this statute was taken advantage of by many physicians, who either associated themselves with an English university, and subsequently became fellows of the college, or simply presented themselves for examination, and were admitted to some of the privileges of the college as licentiates.

This latter provision may, in some degree, account for the fact mentioned by Huber, that medical studies, such as they were, estranged themselves from the universities, and the few efforts made for a revival of them only prove by their failure how unfavourable was the academic soil and atmosphere of England at that particular time*; it was not, however, the intention of the founders of the college to oppose themselves to the universities.

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* Annals of the College; see also Goodall, pp. 316, 318.

The medical education obtainable in Italy was infinitely superior to that which could be obtained in England, and hence the fashion, which we have referred to, of going abroad in pursuit of knowledge; but when the taste for literature extended itself into England, an attempt was made to meet the deficiency by the introduction of foreign professors; and, as early as 1508, we are informed by Wood, in his "Annals of Oxford University," that a certain Antonius Alazardus from Montpellier gave lectures on medicine with much success; and again, in 1575, the same author mentions a foreign physician whose lectures were very popular.†

But neither the imposition of fines, nor the propagation of knowledge, diminished the evil which the college was intended to eradicate; for, in spite of every effort on the part of the universities, and of the exercise of the extensive privileges and authority of the new medical corporation, this latter had to defend itself from an inundation of quacks which burst forth from the monasteries which Henry VIII. had dissolved and abolished‡, as well as from every other form of empiricism; and, if we attempt to penetrate into the circumstances which favoured the continuance of such unlicensed and illegal practice, we cannot fail to trace the source to the network of ignorance, superstition, and prejudice, which surrounded every gradation of society; nor can we, in reading the Annals of the College, disparage the firmness and severity of the new medical police in its endeavour to protect, not only the educated and licensed practitioner, but also the rights of the academic degree, as a qualification for higher practice.

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* Newman's Huber, vol. i. p. 344.

† Id. Ibid.

‡ Ibid. vol. i. p. 345.

Edward VI. was sacrificed by the misjudgment and presumption of Warwick, duke of Northumberland, who dismissed the king's physicians, and, by an order of council, consigned him into the hands of an ignorant woman, who promised in a little time to restore him to health; but after the use of her medicines, all the bad symptoms of his disease increased to the most violent degree, and he quickly died.*

At no time had the mysteries of astrology, or the fantastic pseudo-science of alchemy, more votaries than in the time of Elizabeth†, and to this latter circumstance may be attributed the fact, that the workers in metals were the most numerous of quacks.

The clergy, too, adhered to their old pretensions, for we read in the Annals of the College, of one Robert Tanner, on whom the Archbishop of Canterbury had conferred a licence to practise physic; but, on being summoned before the president and censors of the college, he was found to be so ignorant and illiterate that he was interdicted the exercise of his craft.

William Forrester also, a master of arts, was complained of by many for receiving considerable sums of money without doing adequate good. He was often admonished and fined for persisting to carry on his nefarious practice in spite of such admonitions.

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* Hume's History of England, chap. xxxv.

† Dr. Andrews's History of England, vol. ii. p. 88.

It was felt, and repeated experience confirmed the sentiment, that these clerical proceedings were not calculated to enhance the dignity or reputation of the medical profession; and a statute was, accordingly, made by the president and college, forbidding the examination of any who had been in holy orders, for permission to practise physic, an act which a careful study of the college annals fully justifies.

The evils of which these and a host of less important though equally mischievous impostors were the instruments, were the great drawbacks to a custom which was peculiarly adapted to the circumstances of the time and people.

Armed with old family receipts for various disorders, many good men and women diversified their daily occupation in gathering simples and concocting medicines for their poor and suffering neighbours, who had neither money to spare nor physicians at hand to relieve their ailments.

William Bulleyn, who was one of the most sagacious physicians and interesting writers of the Elizabethan era, alludes to several persons of this description, particularly to Sir Thomas Elyot, who is also spoken of by Wood in his "Athenæ Oxonienses" as a good grammarian, Grecian, poet, philosopher, physician, and to complete all, a gentleman.* Bulleyn also extols Sir Philip Parris of Cambridge as a man of singular learning; and Sir William Gascoyne of Yorkshire that helped many sore eyes, the Lady Tailor of Huntingdon, and the Lady Dorrel of Kent, who had many precious medicines to improve the sight and heal wounds. All these, he says, were "well seen in herbs."

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* Sir Thomas Elyot wrote several works, amongst the rest the "Castle of Health," wherein he speaks of colds as having lately been introduced into England. Their becoming common he imputed to banquetings after supper, and drinking much wine after sleep.

Bulleyn himself was a celebrated botanist. He resigned the functions of a parish Rector to follow the practice of medicine, for which he travelled, and, as he informs us in his "Book of Simples," became so well acquainted with the natures of the people and the products of the soil, that to that he attributed his power to describe them so well, and employ them so successfully in the restoration of health.

He settled at Durham where he practised with great reputation, and was in favour with Sir Thomas Hilton, Captain of Tinmouth Castle, under Philip and Mary.*

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* Dr. Bulleyn removed to London in 1560, after which his life was one continued series of troubles until he died in 1576, and was buried in the same grave wherein John Fox, the martyrologist, was also interred ten years after him, in St. Giles's Church, Cripplegate. (See "Biographia Britannica.") Bulleyn dedicated his book, "The Government of Health," to his patron, the Baron Hilton. In praise of temperance and sobriety he writes :—

> "Esse cupis sanus? sit tibi parca manus;
> Pone gulæ metas, ut sit tibi longa ætas."

Or,

> "If for health you are thinking, be not often drinking;
> If you'd live long quiet, be sparing of diet."

Of the physicians of his day, such especially who had advanced the art of surgery among the worthy fraternity of surgeons in London by their lectures in anatomy, he commends the learned Dr. John Caius, for revealing to the said fraternity the hidden jewels and precious treasures of Galen. "Who shall forget," he adds, "the most worthy Dr. William Turner, whose learned acts I leave to the witty commendations and immortal praise of Conradus Gesnerus? yet his 'Book of Herbs' will always grow green, and never wither, as long as Dioscorides is had in mind among us mortal wights. In the noble state of knights, which of them did ever in race give a trip, outrun, or win the victory of Sir Thomas Elyot, Knight? Who

Subsequently he came to London, and was elected a Fellow of the College of Physicians, having studied at Oxford. He was the first to speak of the Buxton waters as possessing virtues to "cure the sore and the lame."

Notwithstanding the many celebrated men who were about the court of Elizabeth, we are told that she manifested a great partiality in favour of Jewish physicians.*

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hath planted such fruitful trees, that his grafts do grow in each place in this our commonwealth, and his 'Castle of Health' cannot decay? Thomas Faire, or Phayer, doctor of physick, is not dead, but is transformed and changed into a new nature, immortal. Dr. Andrew Borde wrote also well of physick to profit the commonwealth withal. I will not forget Master Thomas Paguinellus, or Paynell, who hath played the good servant to the commonwealth in translating good books of physick. Dr. William Kunningham hath well travailed, like a good soldier, against the ignorant enemy, setting forth the praise, recommendation, and profit of astronomy, cosmography, and geography: a father in physick, whose learning gave liberty to the ignorant, with his 'Whetstone of Wit,' and 'Castle of Knowledge.'" Altogether he names about one hundred and twenty celebrated men, foreign and English. The latter are Dr. Bartholomew, Dr. Barclay, Dr. Butts, Dr. Clemens, Dr. Chambers, Dr. Caldwell, of Oxford, Dr. Edwards, of Cambridge, Mr. Edmunds, surgeon of York, Mr. Gale, of London, Dr. Hector, of Cambridge, Dr. Robert Huyck, the queen's physician, Dr. Freer, of Cambridge, John Porter, of Norwich, Dr. Langton and Dr. Larkin, of Cambridge, Dr. Masters, Robert Balthrop, surgeon, Thomas Colfe, apothecary, Dr. Wendy, of Cambridge, and Thomas Vicars, or Vicary, the surgeon of London.

* Dr. Andrews's "Hist. of England," vol. ii. p. 63. This humorous historian alludes to "the same fantastic preference which made Francis I., when indisposed, apply to Charles V. for an Israelite, who was an imperial physician. Accordingly the person whom he sought for visited Paris; but the king, finding that he had been converted to Christianity, lost all confidence in his advice, and applied to his good ally, Soliman II., who, sending him a true hardened Jew, the monarch took his counsel, drank asses' milk, and recovered."

In some respects Elizabeth might be called cosmopolitan, but the world of which she was a citizen was constituted of those who ministered to her vanity, and contained but few, if any, Englishmen of genius.* Her health she trusted to a foreign Jew named Rodrigo Lopez rather than to her own countrymen, and she narrowly escaped suffering for her ill-placed confidence, having been nearly poisoned by Lopez, who was fairly convicted of the attempt.

Any discouragement, however, which the laches of royalty may have occasioned, was more than counterpoised by the independent exertions of the College of Physicians, to maintain the privileges and exalt the honour and respect of its members. But, curiously enough, it has been made a ground of complaint that the new medical corporation had not self-denial enough to reject the independence and dignity forced upon it.† The censure, it is true, was uttered only in relation to the English universities, which were less patronised by students in medicine than were the universities of France and Italy. But then the English universities undervalued medical studies in comparison with theological, and a degree of mutual distrust was the result. Physicians, on the one hand, misprized the theological discussions in which they were every moment liable to be made partizans; and theologians, on the other hand, suspected the orthodoxy of physicians, whose characters were often assumed by Jesuits and dissemblers.‡ It is not, therefore, to be wondered at, that the college thought far more highly of its own, than of the university diplomas, and made it the first consideration to protect its own privileges and dignity, rather than to punish any invasion of the university degree; a duty wherein it could, fortunately, depend upon the good offices of the justiciary in cases of need.

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* Hume's History of England, appendix iii. sec. 6.

† Newman's Huber, vol. i. pp. 345–347.

‡ Ibid. vol. i. p. 347.

Had the college been less liberal in the construction of its statutes for the admission of candidates, and, by rejecting the independence complained of, satisfied itself with an ancillary and subservient relationship to the English universities, in excluding individuals for examinations by reason of their education in foreign schools, the state of the medical profession at the present day might have been more dignified than it now is; but we should, probably, not enjoy much of the knowledge which we now possess.

It never was the aim of our universities to educate men to be good physicians, but to educate gentlemen, and in this one respect it is to be regretted that those institutions were undervalued; for if the other course had been adopted, the minor distractions arising from predilections for this or that medical school, and the thousand petty jealousies which we too frequently hear of, would have been silenced by the expansive enlightenment and generous sentiments proceeding from a university education.

But, on the other hand, the services of many well-informed men would have been lost to the state, the difficulties of administering the college authority would have been infinitely augmented, and some ground would have existed for the charge of monopoly, a charge which was actually made, although especially guarded against by the decree that *all* who were examined and found competent should be admitted to practise physic. At the same time all possible delinquencies appear to have been foreseen, for it was decreed that if any member of the college were guilty of a public crime, or infamous for vice, he should be expelled.*

Thus every prerogative of the college was exercised with vigour and justice, whilst the more agreeable duty of extending the boundaries of medical knowledge was faithfully performed; and, in a city like London, where large hospitals existed†, this could be more effectually accomplished than at either university.

The lectures on anatomy, commenced by Caius, were continued, with occasional interruptions, when the presence of the plague, or other malignant epidemics, made it appear dangerous to demonstrate the dead subject.‡

In addition to the above, public lectures in surgery were instituted in 1582, by John Lumleie (Lord Lumleie), and Richard Caldwell, M.D., to be read in the College of Physicians "to the honour of God, the common profit of her majesty's subjects, and good fame, with increase of estimation, and credit of all the surgeons of the realm." Dr. Forster was the lecturer first appointed, and, from all we read of him, it is manifest that he had the mind of a scholar, with the heart of a gentleman; qualifications which were then, as they are now, well calculated to add lustre to a profession which requires a combination of judgment, feeling, and honourable conduct.

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* "Statuimus et ordinamus, ut si quis criminis alicujus gravioris ac publici reus, aut vitio aliquo infamis fuerit, ablegetur à collegio, ne si retineremus talem, videremur aut virtutem contemnere, aut eodem morbo laborare."—*Annals.*

† It is said that Edward VI., moved to charity by the preaching of Bishop Ridley, founded St. Thomas's Hospital, A.D. 1552. It was originally an almshouse, established by Peter de Rupibus, Prior of Bermondsey. Dr. Andrews assigns the same date to St. Bartholomew's Hospital, but it was founded by Henry I. in 1102. It received, however, considerable additions in the sixteenth century by Henry VIII.

‡ In 1569 Dr. Lopus was summoned to demonstrate the human body in the Royal College of Physicians, failing in which he was fined four pounds, and Dr. Smythe was nominated instead; but the plague prevailing, the demonstration was postponed. — *Annals of the College.*

As it is the self-imposed duty of the historian to reproduce to the mind of his reader the circumstances of the past, I will, even at the risk of being tedious, venture to transcribe the account of the foundation of these, the Lumleian Lectures, by an impartial and able chronicler of that time; seeing that it was in one course of them that Harvey first made public the true doctrine of the circulation of the blood.

It was ordained that the reader was to be a Doctor of physic, "of good practise and knowledge, and to have an honest stipend, no lesse than those of the universities erected by King Henrie VIII., namelie, of law, divinitie and physicke, and lands assured to the said college for the maintenance of the publike lesson; whereunto such statutes be annexed as be for the great commoditie of those which shall give and incline themselves to be diligent hearers for the obteining of knowledge in surgerie, as whether he be learned or unlearned, that shall become an auditor or hearer of the lecture, he may find himselfe not to repent the time so imploied."

"First, twise a week thorough out the yeare; to wit, on Wednesdaies and Fridaies, at ten of the clock till eleven, shall the reader read three quarters of an houre in Latine, and the other quarter in English, wherein that shall be plainlie declared for those that understand not Latine, what was said in Latine."

"And the first yeare to read Horatius Morus' tables, an epitome or briefe handling of all the whole art of surgerie, that is, of swellings or apostems, wounds, ulcers, bonesetting, and healing of bones broken, termed commonlie fractures, and to read Oribasius of knots, and Galen of bands, such workes as have been long hid, and are scarcelie now adaies among the learned knowen, and yet are (as the anatomies) to the first enterers in surgerie and novices in physicke; but amongst the ancient writers and Grecians well known. At the end of the yeare, in winter, to dissect openlie in the reading place all the bodie of a man, especiallie the inward parts, for five daies togither, as well before as after dinner; the bodies may so last without annoie."

"The second yeare to read Tagaultius' institutions of surgerie, and onelie of swellings or apostems, and in the winter to dissect the trunke onelie of the bodie, namelie from the heade to the lowest part where the members are, and to handle the muscles especiallie. The third yeare to read of wounds onelie of Tagaultius, and in winter to make publike dissections of the head onelie. The fourth yeare to read of ulcers onelie the same author, and to anatomize or dissect a leg and an arme for the knowledge of muscles, sinewes, arteries, veines, grestles, ligaments, and tendons. The fift yeare to read the sixt book of Paulus Ægineta, and in winter to make anatomie of a skeleton, and therewithall to shew and declare the use of certeine instruments; as Scamnum Hippocratis, and the other instruments for setting in of bones. The sixt yeare to read Holerius of the matter of Surgerie, as of medicines for surgeans to use. And the seventh yeare to begin againe, and continue still."

"A goodlie and charitable erection doubtlesse, such as was the more needful, as hitherto hath beene the want and lacke so hurtfull: sith that onelie in eche universities by the foundation of the ordinarie and publike lessons, there is one of physicke, I meane so as physicke is now taken separatelie from surgerie, and that part which onelie useth the hand as it is sorted from the apothecarie. So that now, England may rejoice for those happie benefactors and singular wellwillers to their countrie, who furnish hir so in all respects, that now she may as compare for the knowledge of physicke, so by means to come to it, with France, Italie, and Spaine, and in no case behind them, but for a lecture in simples, which God at his pleasure may procure, in mooving some hereafter in like motion and instinct, to be as carefull and beneficiall as these were to the helpe and furtherance of their countrie. At the publication of this foundation, which was celebrated with a goodlie assemblie of doctors, collegiats, and licentiats, as also some masters of surgerie, with other students, some whereof had been academicall; Doctor Caldwell, so aged that his number of yeeres with his white head adding double reverence to his person, (whereof I may well saie no lesse than is left written of a doctor of the same facultie verie famous while he lived:

'Conspicienda ætas, sed et ars provectior annis,
Famaque Pæonio non renuenda choro.')

even he, notwithstanding his age and impotence, made an oration in Latine to the auditorie, the same by occasion of his manifold debilities, unfinished at the direction specialle of the president, who (after a few words, shortlie and sweetlie uttered) gave occasion and opportunitie to Dr. Forster, then and yet the appointed lecturer, to deliver his matter, which he discharged in such methodicall maner, that ech one present indued with judgement, conceived such hope of the doctor, touching the performance of all actions incident unto him by that place, as some of them continued his auditors in all weathers, and still hold out; whose diligence he requiteth with the imparting of further knowledge than the said publike lecture dooth affoord. When the assemblie was dissolved, and the founder accompanied home, diligent care was taken for the due preferring of this established exercise: insomuch that Dr. Caldwell and Dr. Forster, to furnish the auditors with such bookes as he was to read, caused to be printed the epitome of Horatius Morus, first in Latine, then in English, which was translated by the said Dr. Caldwell. But before it was halfe perfected, the good old doctor fell sicke, and as a candle goeth out of itselfe, or a ripe apple falling from the tree, so departed he out of the world at the doctor's commons, where his usual lodging was; and was worshippfullie buried."*

From the above we may form a pretty accurate idea of the earnest zeal with which the College of Physicians applied themselves to advance the art of surgery; but in a posthumous edition of the "Tables," it is obvious that the lectures were not appreciated by the great mass of surgeons, for the editor (E. Caldwell) in addressing that body strongly reprehends their neglect in not frequenting the lectures founded for their sakes.

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* Holinshed's "Chronicles," vol. iv. pp. 496–498. Caldwell was called the English Hippocrates and Galen. He was buried in St. Bennet's Church, Paul's Wharf, and on each side of a copper plate, on which his arms were engraved, and fixed on the wall over his grave, are representations of bandages and surgical instruments such as were then used. For the support of the Lumleian lectures, a perpetual rent charge of forty pounds per annum was laid on the estates of Lord Lumley and Dr. Caldwell. The tables of surgery, briefly comprehending the whole art and practice thereof, were originally compiled by Horatius Morus, a Florentine physician. Aikins's "Biog. Mem. of Med."

Moreover, it was no uncommon thing for the college to command the attendance of surgeons, against whom complaints had been made, or doubts entertained, by the parents of patients to whom those surgeons had administered internal remedies which were supposed to have done harm. Many instances of this kind are recorded in the Annals *, and in reading some of them, a fear is apt to flash across the mind that the power which the president and fellows possessed, like other good things, may have been abused; especially when we remember the case of Dr. Groenvelt at a later date, to which we shall have to refer †; but the time was exceptional, and attended with difficulty as well as danger of the kind alluded to. The latter instance, however, is quoted more for the purpose of illustrating hypothetical cases than any other recorded act of persecution, for the great majority of surgeons thus impeached were so unequivocally ignorant and incompetent to prescribe any internal remedies, that we feel the justice of the admonition addressed by the college to the master and wardens of the Company of Surgeons in 1595, enjoining them to take some discreet order for the abolition of the practice of administering medicines, which had gradually crept in.

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* See "Annals for 1569," where it appears that James Alcock was cited to appear before the college.

† Dr. Groenvelt, or Greenfield, was the first to employ cantharides internally as a remedy, for which he was committed to Newgate by warrant of the College of Physicians.

In Scotland, a College of Surgeons was chartered as early as 1505*, but the progress of medical knowledge, although not so exactly defined, seems to have advanced conformably with that of England, but with somewhat slower steps.

A clause was introduced into their charter to the effect, "That na persoun man nor woman within this burgh mak nor sell ony aquavite within the samyn except the saidis maisters brether and friemen of the saidis craftis under the paine of escheit of the samyn but favouris." In spite, however, of their chemical knowledge to insure a superior article, and their medical lore to superintend its administration, they have lost that invaluable part of their privilege.†

The alliance with barbers, which was universal in all the cities of Europe, existed also there; notwithstanding that some of the surgeons held high offices about the court, and some belonged to families of high consideration in the ancient kingdom of Scotland.‡ But we have good reason to infer that their social position did not excite them to emulate even their English fraternity in surgical skill, from the circumstance which is recorded in the council-books of Edinburgh, dated A.D. 1595, when Awin, a French surgeon, was prohibited, by the common council, from practising surgery, except cutting for stone, curing ruptures, couching cataracts, curing the pestilence, and other grave duties.

In 1581 a College of Physicians was created by the king's letters patent, with exclusive powers to regulate the practice of physic within Edinburgh and its neighbourhood, and to fine such as should take on them to act as physicians without warrant from the college.*

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* Historical Sketch of the Royal College of Surgeons of Edinburgh, by John Gairdner, M.D., p. 4. 1860.

† Ibid. p. 6.

‡ Ibid. p. 11, note 4.

With what amount of justice and impartiality the internal government of these colleges and corporations was administered we have no very positive means of judging: it is, however, scarcely in the nature of any human institution, endowed with irresponsible power, to be conducted without some degree of favouritism.

But of the more salient points of medical history during the sixteenth century, we have more definite views, which it is impossible to contemplate without a deep conviction that they merit our grateful eulogy. It was a period during which much of the ancient literature of Greeece was rescued from neglect, and a new train of original thought was engendered; much human imbecility and many prejudices were rooted out, and reason was made to vindicate its high prerogative; the arrogance of shallow dogmatism was successfully opposed, and a spirit of free inquiry put in force. But of all the great and varied obligations which we owe to men who have bequeathed to us these blessings, the warning which we derive from their errors is by no means the least.

The most obvious of these errors are precisely those which we are called upon to guard against at the present day; hence a few summary and concluding remarks concerning them may not be unprofitable; and, from the considerations which have been advanced, they may be ranged under the following propositions:—

1st. *That physicians submitted themselves to a position of undue dependence on the opinions and dogmas of others.*

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* Andrews's "History of Great Britain," p. 71. This was a year after the Edinburgh University was founded by James VI.

Notwithstanding the efforts of Argentier and Fernel to break through the trammels of Hippocrates and Galen, and, by their example, to incite some few others to pursue their own independent researches, and to put in force the right of private judgment, the great majority of practitioners surrendered their reasoning faculties to the decisions of their Greek masters, and so acquired that book-knowledge and contempt of counter-experience, which would justify the derisive satire lanced against them some centuries before, that they would be the most ridiculous pedants on earth if there were no grammarians to dispute the prerogative.

2nd. *That rare and exceptional cases were the great objects of pursuit, whilst those of common occurrence were unjustly neglected.*

We have had occasion to refer to this great fault in our observations on Trincavelli and Valleriola; and what is true of them is equally true of physicians generally, who were more intent on enriching their tedious Latin folios with wonderful topics, than on extending the practical usefulness of their art and the boundaries of science, by judiciously observing and faithfully recording the events of their daily experience.

3rd. *That special facts in pathology, as suggestive of treatment, were comparatively disregarded.*

Whether this proposition needs confirmation or not, it *receives* confirmation in too many instances at the present day. But when Eustachius imagined that pathological investigations might be made available equivalents to experiments, as well for the treatment of disease as for the determination of organic functions, all practitioners of medicine gave a persevering attention to symptoms in directing their curative agents, rather than to the morbid condition of the special organ which produced those symptoms. The Galenic doctrine of elementary qualities, from its apparent simplicity, was too seductive to be given up; and although a great improvement was achieved in diagnosis and prognosis by the application of the knowledge acquired by Savonarola, the important matter of treatment remained pretty much as it was before.

4th. *That credulity and superstition still prevailed.*

It is painful to revert to the subject of self-delusions after the encouraging review which we have made of the pioneers of modern science; but the unanswerable logic of facts shows how ready the great bulk of mankind at all times is, to accept the most ridiculous and irrational solution for every question of more than ordinary interest. *Populus vult decipi et decipitur* is an axiom which never received more copious illustration than in the sixteenth century, when physicians were as willing as the most ignorant dupes to give full faith to every marvellous tale, without weighing the probability of its truth.

As if to make illusions the Alpha and Omega of this volume, I am here led to speak of a sect of hermetical dreamers, who represented themselves as having first appeared in Germany, in 1302, and to have revived early in the seventeenth century.

They professed to hold and to teach the same doctrines as did the ancient philosophers of Egypt, the Chaldean Magi of Persia, and the Gymnosophists of India. They swore fidelity, promised secresy, and wrote hieroglyphically.

The object of the sect was nothing less than the reformation of the whole world! The members were supposed to exercise no other profession than that of medicine, for the practice of which they were to exact no fees. They were, nevertheless, assumed to acquire unbounded wealth for distribution among sovereigns and princes, as the price of their cooperation in diffusing love, and joy, and liberty, and happiness throughout all nations.

The statement of the precise way in which this latter condition was to be fulfilled, does not appear to have been thought necessary, but the scheme was nevertheless proposed to be worked out; and occurring as it did to a peculiar race of people who are not given to put out of sight many questions which might inconveniently stand in their way, it does flash on the mind that it might have been a cutting sarcasm, like that which is attributed to Euricius Cordus, a poor German poet and physician, who was also a reformer, but not in this peculiar way.*

The general idea was grand, although some may call it visionary; it was, however, obviously dictated by a philanthropic mind, and pursued with an ardent desire to see the Christian feelings, which it embodied, fully realised: howbeit, to those persons who have the disagreeable faculty of looking at both sides of a question, this too may appear a satire on the peculiar morality of the times.

The project was set on foot in 1603, by Valentine

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* Euricius Cordus was born (1486) at Simtshausen, a village near Frankenberg, in Hesse. He was the son of a farmer, but was himself a poet, and wrote many poems in praise of Luther. After a severe epidemic at Erfurt, he studied medicine, and practised until he died in 1536. He was the author of the following excellent epigram:—

> "Tres medicus facies habet; unam quando rogatur,
> Angelicam; mox est, cum juvat, ipse Deus.
> Post ubi curato, poscit sua præmia, morbo,
> Horridus apparet, terribilisque Sathan."

Andreæ, a Lutheran ecclesiastic of Calwe, in Wurtemberg, a man of learning, genius, and philanthropy. From his autobiography, preserved in the library of Wolfenbuttel, we learn that he composed the celebrated "Noce Chimique," which was an exposition of the nature and object of the institution, as it has been described.*

At the time of drawing it up, however, he presumed on the credulity of his neighbours, by representing it as a mere transcript of a similar work by one Christian Rosenkreutz, who was said to have instituted the society in the fourteenth century, after having studied at Fez and in Egypt the high oriental philosophy. In a sportive mood, he called himself Andreæ, Knight of the Red Cross; and to give point to the conceit, he adopted for his seal a cross with four roses, which, in many minds, was sufficient to have awakened suspicion.

But there is no device so quixotic, no system of opinions, be it ever so absurd, that will not find followers. To a large proportion of mankind, indeed, the most extravagant romance, if it be but based on a plausible fallacy, is of the greatest intellectual comfort. And what more comforting than the promise of exemption from all physical infirmity, either of disease or age? An immunity necessarily accruing from the possession of the secret of the philosopher's stone, of which they professed themselves to be the masters.*

The notion of reforming the entire world by their exalted wisdom resulted from the idea that they were immediately inspired by the bloody cross of Christ, independently of any laborious study. This conceit fostered in the society a supreme contempt adopted worldly knowledge, and, like Paracelsus, they professed to be sent direct from God to perform miraculous cures, by virtue of their endowments, which were precisely those attributed to persons in possession of the philosopher's stone.

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* Encyclopædia Britannica.

Their conclusions were legitimate enough; unfortunately, however, the principles on which those conclusions were founded were not equally correct, for the ground which they took was precisely that which, on any other question, even they would have entirely abandoned: but then there are ideas which must have an incarnation, be they ever so absurd or illusory; and the advantage of realising them in the flesh is that, like all other mortal things, they contain within themselves the germs of dissolution.

Andreæ felt this, and confessed that the whole scheme was an invention, which he propounded for the purpose of ridiculing the extravagant and fanatical notions of the Alchemists and Theosophists, then abounding in Europe, by representing the institution of a society more extravagant still. The conception, however, which was set forth in jest, was taken up in earnest by Nicholas Barnaud, of Dauphiné, a protestant philosopher and theologian, who had previously published many tracts on alchemy. He resorted to the migratory practices of the alchemists for the purpose of propagating the doctrine of ardent fraternity and universal reformation; and so great was his success in Germany and France, that a secret society was established on the principles of the "Noce Chimique," in 1610, the members of which, under the auspices of Barnaud, called themselves Rosicrucians.

The sportive Andreæ, who had evidently an instinct

Andreæ, ludicrous, appreciated the joke, and avowed that he was unable to restrain a laugh when he saw his caprice, which was, in fact, nothing but an exaggeration of the absurdities of Paracelsus, and intended only as a satire, adopted in seriousness as a true history, and made the foundation of a secret society.

Finding his conceit so popular, however, he published another work on the same subject, in 1614*, in the very name of which there is a certain amount of transparent fun; but the adoption and propagation of his phantasy, which might have betrayed a less sagacious man into a belief in its practical utility, did not, it seems, seduce him into the folly of confusing the suffrage of his superstitious countrymen with a demonstration of truth; for he subsequently ridiculed their infatuation, and carefully distinguished the *Fraternitas Rosæ-Crucis* from the *Christian Brotherhood*, of which he was also the founder some few years after.†

The statutes of the society of Rosicrucians, which were inscribed in the "Fama Fraternitatis," enjoined the following observances:

1st. That the members were to exercise no other profession than that of medicine, for the practice of which they were to exact no fees.

2nd. That there should be a yearly reunion of the members in the chapel of "Saint Esprit," on the fête-day of their grand-master Rosenkreutz.

3rd. That they should adopt the costume of the country in which they might reside.

4th. That they should propagate their doctrine to the clever and expert laity.

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* Fama Fraternitatis Rosæ Crucis.

† This latter society was denominated the Fraternitas Christiana.

5th. That the word *Rosenkreutz* should be adopted for mutual recognition.

6th. That the existence of the society should be concealed for an entire century.

To the last enactment may be attributed, perhaps, the pretension to antiquity of which the society boasted; but it is more than probable, that the importance attached to it on this score was a fiction, and that the whole thing was nothing more nor less than the climax of the Paracelsean impostures.

It is because of this presumptive association that I have anticipated the history of the first two decades of the seventeenth century, in order that we may not have to revert to any detailed account of the Rosicrucians.

A host of enthusiasts followed in the wake of Andreæ*; and many empirics, adapting themselves to all times and to all circumstances, found, in his flight of fancy, a source of wealth too advantageous to be neglected.

It is to this latter fact that I would more particularly direct the attention of my readers, and to the probable cause, as the foregoing history appears to be evidence, of the propagation of quackery, notwithstanding discoveries in anatomy and physiology which would seem to make this plague-spot an impossibility. I would appeal to its existence, however, as well as to medical polemics, as proofs that there was, as there is still, something defective both in teaching and acquiring the knowledge of medicine.

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* The most celebrated of the Rosicrucians were Valentine Wiegel, Jacob Boehm, Egidius Gutman, Michael Mayer, Oswald Crollius, and Robert Fludd, an English physician. Buhle imagines that the Rosicrucians are but a branch of the Freemasons, one degree of which is said to be called, in some countries, the Degree of the Red Cross.

It is a branch of human learning in which a greater freedom of discussion has been permitted throughout all ages than in any other department of human thought, and a corresponding variety of opinions has been the result. The Methodists, the Pneumatists, the Galenists, nay, even the Sceptics, and other sects and schools, retained their respective representatives up to the period of which we are treating; there was no principle from which to proceed in medical education; and as every dogma possessed certain elements of truth, the credence which all received impressed on medicine an aspect of confusion. To this, and this alone, may be attributed the scepticism which many pragmatical men professed to entertain in relation to the efficacy of the resources of physicians, and hence the charlatan found his success, not only in the ignorance of unbelief, but also in the heterodoxy of discordant opinions.

Now it is because we recognise in the anatomical discoveries of Aristotle and Galen, and still more in those of the anatomists of the sixteenth century, the elements of a science which every student of medicine, whatsoever his creed may be, *must* bow to, that I have undertaken to record those remarkable instances of the explanation of the laws of causation, which subsist in the complex phenomena of life; whereby we are brought nearer and nearer towards the comprehension of those ulterior phenomena of disease, and the action of their remedial agents.

If the phenomena of life are to constitute the solid and irresistible foundation of medical *science*, it is obvious that they must not be made subservient to every conflicting tenet; but, on the contrary, that they must be isolated from the art, and studied abstractedly, so as to impress on the science which they constitute an original and independent character.

Being thus established on the immutable laws of nature, and irrespective of any immediate application, biology must of necessity supply the principle by which all medical speculations must be tested, and by which all antagonistic opinions must be judged.

How far these views have been, and now are being fulfilled, will form the subject of the succeeding volume.

APPENDIX I.

PRINCIPAL EPIDEMIC DISEASES OF THE SIXTEENTH CENTURY.

1500.	Plague in London continued, and carried off 30,000.—*Webster.* From 1500 to 1503, mould spots (signacula) in Germany and France.—*Hecker.*
1502.	Glandular plague in Brussels.—*Webster.*
1503.	Glandular plague in Germany and France.—*Hecker.*
1504.	Plague in Spain. Encephalitis. Putrid-fever and malignant pneumonia in Germany.—*Hecker.* Pestilential fever universal.—*Webster.*
1505.	Plague in Portugal. First epidemic petechial fever in Italy, which did not pass the Alps in that year.—*Hecker.*
1506.	Second appearance of the sweating sickness in England.—*Holinshed* and *Hecker.* Pestilential epidemics in Spain.—*Hecker.*
1507.	Pestilential epidemics in Spain continued.—*Hecker.*
1508.	Earthquake at Constantinople, which killed 13,000, after which came a plague which depopulated the city.—*Holinshed.*
1509.	Pestilence at Calais.—*Holinshed.*
1510.	Influenza throughout Europe.—*Webster.* Stoope gallant reigned throughout Scotland. Plague in divers parts of England.—*Holinshed.* Plague in the north of Europe.—*Hecker.*
1511. 1512. 1513.	Malignant fever and dysentery, beginning at Verona and extending over Europe.—*Webster.* In 1513 these diseases extended to London.—*Holinshed.*
1515.	Malignant sore throat (diphtheria?) in Holland.—*Webster.*
1517.	Early in the year epidemic tracheitis and œsophagitis in Holland, lasting only eleven days. It extended southward, and appeared in the summer at Basle. Encephalitis in Germany. In July, a third visitation of the sweating sickness; spreading with great malignity all over England, and amongst the English at Calais. In December, immediately after the sweating sickness, a plague occurred in England and lasted throughout the winter. Smallpox in Hispaniola.—*Hecker.*

1518.	Plague in England continued.—*Hecker.*
1519.	Sweating sickness in England from July to December.—*Holinshed.*
1520.	Lepra in Germany (Gravamina nationis Germanicæ).
1521.	Michaelmas Term deferred to the morrow of St. Martin's for fear of plague.—*Baker.*
1524.	Great plague at Milan.—*Hecker.*
1526.	Great death in London, so that the Term was adjourned.—*Holinshed.*
1527.	Plague in Italy and Wittenburg.—*Hecker.*
1528.	Sweating sickness in England.—*Holinshed.*
1530.	Great death in London and other places of the realm.—*Stow.* From 1528 to 1534 famine existed over the greater part of Europe.—*Hecker.*
1534.	Malignant fevers (endemic throughout Europe).—*Hecker.*
1535.	Malignant fever in Italy.—*Sprengel.*
1537.	Malignant fever throughout Lombardy.—*Sprengel.*
1538.	Epidemic dysentery in France.—*Hecker.*
1540.	Great death by a strange kind of hot ague and fluxes; universal throughout most parts of the realm.—*Holinshed.*
1541.	Plague in Constantinople.—*Hecker.*
1542.	Plague in Hungary.—*Hecker.*
1543.	Plague and petechial fever in Germany.—*Hecker.*
1544.	Great death of the pestilence in London.—*Holinshed.*
1545. 1546.	Trousse gallant in France, of which 10,000 English died at Boulogne.—*Hecker.*
1547. to 1551.	Plague in Holland and France. Petechial fever in the Imperial army. Mould spots in Germany.—*Hecker.*
1551.	Sweating sickness in England; extending to Antwerp and other countries, but only amongst the English.—*Holinshed.*
1552. 1553.	Malignant fever in Germany and Switzerland.—*Hecker.* This fever recurred every few years.—*Jno. Lange.*
1555. 1556.	Hot burning fevers, and other strange diseases, consumed many people in all parts of England; particularly aldermen, of whom seven died between October and December.—*Holinshed.*
1557.	Petechial fever in France.—*Sprengel.* Hooping-cough also prevailed in France.—*Pasquier.*

1558.	A great death of old people through vehement quartan agues.—*Holinshed* and *Stow*.
1561.	Smallpox prevailed.—*Annals of College of Physicians.*
1562.	Coryza and pleuritis prevailed.—*Ibid.*
1563.	Plague began at Newhaven and extended to London, where 23,312 died of it in that and the following year.—*Holinshed.*
1564.	Plague in W. of France and Germany, where 300,000 died of it.—*Holinshed.* Epidemic pleurisy in England.—*Sprengel.*
1565.	Dancing mania or tarantism.—*Mattioli.* Epidemic pleurisy in Holland.—*Sprengel.*
1566.	Hungarian petechial fever.—*Thomas Jordan.*
1568.	Plague in Paris.
1569.	Plague in London — no Lord Mayor's feast in consequence.—*Holinshed.*
1570.	Plague throughout Europe.—*Stow.*
1574.	Plague in England — no Lord Mayor's feast in consequence.—*Holinshed.*
1574. to 1577.	Plague general in France and England.—*Holinshed.*
1577.	Strange sickness at Oxford.—*Holinshed.*
1580.	Hooping-cough and influenza throughout Europe.—*Mézeray.*
1581.	Raphania (Kriebel Krankheit) or gangrene from diseased corn in Brabant.—*Sprengel.*
1583.	Plague in London.—*Holinshed.*
1586.	Sudden and strange disease at Exeter.—*Holinshed.*
1587.	Petechial fever in Northern Italy.—*Sprengel.*
1588. to 1595.	Raphania (Kriebel Krankheit, or spasmodic tragedy) throughout Germany.—*Sprengel.*
1598.	Tschæmær or Hungarian disease.—*Cober* and *Sprengel.*

APPENDIX II.

CHRONOLOGICAL TABLE OF SPECIAL FACTS, CONTRIBUTING TO ESTABLISH THE SCIENCE OF MEDICINE.

B.C.		
	Squill (Scilla maritima), known as a diuretic, and used in dropsies .	Ancient Egyptians.
	Oxide of iron, used as a medicine .	Ditto.
13th cent.	Remedial powers of many plants, studied by	Æsculapius.
7th cent.	Assafœtida (Ferula Assafœtida) discovered and used as an antispasmodic, by	Aristæus.
5th cent.	Mind distinguished from body, by .	Anaxagoras.
4th cent.	Facts observed and recorded in treatises*, and the doctrine of nature (φύσις) first propounded by	Hippocrates.
	The alimentary canal divided into jejunum and cæcum. The peculiar endowment of contractility first attributed to muscles. Nerves demonstrated. Ventricles of the heart, so called. Aorta, so named, and its origin referred to the heart.	
	Distinguishing characteristics of Man as compared with Quadrumana. Division of the animal kingdom into Vertebrate and Invertebrate, by	Aristotle.

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* The difference of opinion which exists among competent authorities, shows that it is impossible to determine which treatises were written by Hippocrates, for reasons stated in the body of this volume; but the following are admitted, by all, to have been composed by him: 1, Prognostics; 2, Epidemics (1st and 3rd); 3, on Regimen in Acute Diseases; 4, on Airs, Waters, and Places; 5, on Wounds of the Head; 6, the Aphorisms. Many other treatises, comprising original observations and important facts, obtained the sanction of his name, for which see the "Disquisition on the Authenticity of the different Treatises which have been attributed to Hippocrates," by Francis Adams, LL.D. in his translation of the genuine works of Hippocrates, for the Sydenham Society; also Dr. Greenhill's article on Hippocrates in Smith's "Dictionary of Greek and Roman Biography and Mythology."

B.C. 4th cent.	Library and school of medicine established at Alexandria by .	Ptolemy Soter.
	Distinction between arteries and veins shown by	Praxagoras.
	Nerves thought to be divisible into nerves of motion and nerves of sensation. Arteries, named as such from being thought to contain air. The tricuspid valve of the heart first described. Lacteals first seen in a goat. The use of the trachea, to convey air to the lungs, first stated by . .	Erasistratus.
	Arachnoid membrane and its reflections over the brain first described. The sinuses of the dura-mater discovered. Retina of the eye first spoken of. Pulmonary artery represented as the arterial vein, and the pulmonary vein named venous artery. The duodenum, so called from being about twelve inches in length. The nerves first traced to their terminations in the spinal cord and brain by	Herophilus.
2nd cent.	An instrument used for crushing stones in the bladder by . .	Ammonius.
1st cent.	Many surgical operations described by	Celsus.
Christian era. 1st cent.	Glandular structures recognised by .	Marinus.
	First work on Materia Medica, by .	Dioscorides.
	Dysentery described, and opium suggested as a remedy, by . .	Archigenes.
	Glandular structure of kidneys shown, and cantharides first used for the purpose of vesication, by .	Aretæus.
2nd cent.	Recurrent nerves, as subservient to voice, suggested, and the hyaloid membrane of the crystalline lens of the eye first described by .	Ruffus of Ephesus.
	A medical school established at Sora, in Asia Minor, by . . .	The Jews.

Christian era. 2nd cent.	Many bones distinguished and named. The vertebral column divided into cervical, dorsal, and lumbar vertebræ. Alimentary canal divided into gula, œsophagus, stomachus, jejunum (including the duodenum of Herophilus), cæcum, colon, and rectum. True function assigned to the vena porta. Arteries shown to contain blood different from that contained in veins. The corpus callosum*, septum lucidum, and corpora quadrigémina, as well as seven pairs of cerebral nerves, and the spinal nerves, first described by	Galen.
4th cent.	Membrana tympani and salivary glands first described by . .	Oribasius.
	The motion of the pulse attributed to the contraction of the left ventricle of the heart, by . . .	Nemesius.
5th cent.	The earliest writer who ascribed medical efficacy to the magnet is .	Aëtius.
	A public hospital for the sick established at Rome by . . .	Fabiola.
6th cent.	Hermodactylus (*Colchicum autumnale ?*) proposed as a remedy for gout. The external jugular vein first opened in disease by . . .	Alexander Trallianus.
7th cent.	Obstetricy first practised as a speciality by	Paulus Ægineta.
	School of medicine established at Salerno by	Benedictine monks.
8th cent.	A medical school and laboratories for chemical manipulations established at Bagdad by . . .	The Caliph Amanzor.

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* Although known to Galen, the Corpus Callosum was so named by Vesalius.

Christian era. 9th cent.	The four recti muscles of the eye, the muscles of the eyelids, the muscular structure of the tongue, and the vascular structure of the testes first described by . .	Theophilus.
	Many articles in present use introduced into the Materia Medica, see p. 127, by	Arabian physicians.
10th cent.	The organ of voice (larynx) described by	Rhazes.
	Mineral waters in the cure of disease advocated by	Haly-Abbas.
11th cent.	Medical diplomas first granted at Salerno; medical schools of Montpellier, Bologna, Naples, and Messina founded by . . .	Frederick II.
12th cent.	Many chemical compounds which are now used in medicine first obtained (vide p. 160) by . .	Alchemists.
	The Universities of Oxford and Cambridge, and St. Bartholomew's Hospital in London established.	
13th cent.	Medical schools of Valencia, Paris, Toulouse, Prague, and Vienna instituted.	
14th cent.	The first Treatise on Anatomy, founded on the dissection of the human body, with wood engravings, by	Mondino or Mundinus.
	Surgery greatly improved, by .	Guy de Chauliac.
	Quarantine in Lazarettos established.	
	Apothecaries first mentioned in England.	
15th cent.	Plastic surgery first practised by .	Vincent Vianeus.
	Printing by means of moveable letters invented by . . .	Guttenburg.
	Many articles added to the Materia Medica on the discovery of America.	

Christian era. 15th cent.	Anatomical plates first published by	Peiligk.
	Universities of Louvain, Erfurt, Leipzig, Ingolstadt, Tubingen, and Upsal founded and endowed.	
	The University and Medical School of Aberdeen instituted by . .	Pope Alexander VI.
16th cent. Date of Publication. 1502.	Fallopian tubes; ligaments of the uterus (ligamentum rotundum excepted); oblique openings of the ureters into the bladder; puncta lachrymalia; uvea of the eye (pigment of the iris); and the first pair of cerebral nerves (olfactory) first described by . .	Gabriel de Zerbi.
1516.	First correct description of the valve of the cæcum; of the termination of the ductus choledocus in the duodenum; of the Whartonian ducts; of the veins of the arm; of the malleus and incus of the ear; of the infundibulum of the brain; of the fourth pair of cerebral nerves (trochleatores); and of the termination of the medulla spinalis at the first lumbar vertebra in the cauda equinæ, by	Achillinus.
1518.	First correct description of the great omentum (gastro-colic) and transverse mesocolon; of the cæcal appendix vermiformis; of the valvulæ conniventes of the intestines; of the relative proportions of the thorax and pelvis in man and woman; of the flexor-brevis-pollicis; of the vesiculæ seminalis; of the separate cartilages of the larynx; of the membranous pellicle in front of the retina (attributed to Albinus); of the tricuspid valve, between the right auricle and ventricle of the heart; of the	

16th cent. Date of Publication. 1518.	semilunar valves at the commencement of the pulmonary artery; of the inosculation between the epigastric and mammary arteries; and an imperfect account of the cochlea of the ear, by	Bérenger de Carpi.
1525.	Chairs of medicine endowed at Cambridge and Oxford by . .	Caius.
1532.	Obstetricy greatly improved by .	Rhodion.
1536.	The peritoneum shown to be a shut sac formed of one continuous membrane, by	Nicholas Masson.
	Foramina nutritia of bones; the ligaments which serve to connect bones together; the vomer; the transversales perinæi muscles; the three branches of the fifth pair of cerebral nerves; the distinction between the pneumo-gastric and sympathetic nerves; the canal of the spinal cord along its entire course; and the valves of veins first described by . . .	Charles Etienne.
1540.	The pterygoid and clinoid processes of the sphenoid bone; the os unguis; the transverse and oblique processes of the vertebræ; several muscles, *to wit*, the obliquus externus and transversalis of the abdomen; the muscles attached to the os hyoides; the valves in the veins of the extremities as well as of the external jugular vein first described by . .	Sylvius.
	Name and medicinal properties accorded to Digitalis purpura by .	Leonhard Fuchs.
1542.	A general description of the ligaments and of the venous system accurately given by . . .	Fernel.
1543.	The osseous system *generally* first	

16th cent. Date of Publication. 1543.	*correctly* described; the pterygoideus internus muscle discovered and represented; the muscular system very accurately described; the chordæ vocales of the larynx; the glandular structure of the stomach shown; the error of Galen respecting apertures in the septum, between the ventricles of the heart, exposed; the vena azygos discovered and described; the coronary arteries of the heart, and several other arteries, *to wit*, the obturatores, the spermatic, the gastro-epiploic, the splenic and the subclavian delineated; the vestibule of the labyrinth or forum metallicum of the ear first represented, as well as many portions of the nervous system, *e.g.* the cervical and sacral plexuses of nerves, the appendix vermiformis and arbor-vitæ of the cerebellum and the pineal gland; the ova of De Graaf were also first pointed out and described by	Vesalius.
	The application of ligatures to arteries for the purpose of arresting hæmorrhage introduced into France by	Ambroise Paré.
1544.	The two tympanic foramina (the fenestra ovalis and foramen rotundum); the tympanic portion of the Vidian nerve denominated "chorda tympani;" the mastoid cells, as forming part of the ear; the cochlea accurately described, and semicircular canals, together with the structure and function of the vesiculæ seminalis first made known by	Ingrassias.
1546.	Pulmonary circulation enunciated by	Servetus.

16th cent. Date of Publication.		
1551.	Valves at the orifice of the vena azygos discovered by	Cannanus and Amatus Luzitanus.
1553.	The stapes of the tympanum and bursæ mucosæ first notified, and the pulmonary circulation re-discovered by	Columbus.
1554.	Ilio-colic valve first described by	Rondelet.
1560.	Semeiology, founded on pathological anatomy, by	Savonarola.
1561.	The aqueduct of Fallopius, containing the chorda tympani; the labyrinth and tympanum so named; several muscles about the head and neck, *e. g.* the occipito-frontalis, the pterygoideus externus, the genio-hyoideus, and all the muscles between the os hyoides and lower jaw, first described by	Fallopius.
1561.	The corpora Arantii contained in the semilunar valves of the heart; the so-called Vidian canal, for the transmission of the Vidian nerve; and the canal which leads from the third to the fourth ventricle of the brain (the aqueduct of Sylvius), first correctly described by	Vidus Vidius.
1563.	The structure of the teeth set forth; the peculiar arrangement of the glandular portions of the kidneys notified; the Eustachian tube of the tympanum and the thoracic duct discovered and described; also the Eustachian valve between the openings of the superior and inferior venæ cavæ, by	Eustachius.
1564.	Lemon-juice first suggested as a prophylactic and curative agent in scorbutus, by	Ronsseus.

16th cent. Date of Publication.		
1570.	About this period it is supposed, by the Italians, that the doctrine of a general circulation of the blood was first enunciated by . .	Sarpi.
1571.	The anatomy of the gravid uterus correctly explained; some of the pelvic muscles defined; the so-called Hippocampus minor in the posterior cornu of the lateral ventricle of the cerebrum, and the Hippocampus major in the inferior cornu, first described by . .	Arantius.
1573.	The stapedius muscle of the ear first demonstrated, and the transverse medullary prolongation, between and at the base of the lobes of the cerebrum (the Pons Varolii), described by . . .	Varolius.
1574.	The right function attributed to the valves of the veins by . .	Fabricius.
	The ductus arteriosus in the fœtal system of circulation first shown by	Carcanus.*
1585.	The cellular investment of muscles and of fat set forth by . .	Piccolhomini.
1588.	The cæcal appendix first correctly described, and the names of most of the muscles, as they are now known, assigned to them by .	Bauhin.
1590.	The structure of the bulbs of the hair demonstrated; the lumbrici muscles specialised; and the attachments of the digastric muscle defined by	Posthius.

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* Carcanus it was who gave the name of Foramen of Botal to the foramen ovale in the septum, between the two auricles; but Botal did not discover that opening, for Galen was acquainted with it, and knew that it closed immediately after birth.

16th cent. Date of Publication.		
1597.	Plastic surgery resumed by . .	Taliacotius.
	First chemical manual published by	Libavius.
1518.	Incorporation of the Royal College of Physicians of London.	
1540.	Incorporation of surgeons with barbers.	
1541.	Public lectures on Anatomy instituted at the Surgeons' Hall.	
1541.	College of Surgeons chartered in Scotland.	
1580.	University of Edinburgh founded.	
1581.	College of Physicians of Edinburgh incorporated.	
1582.	The Lumleian Lectures instituted in the Royal College of Physicians.	

END OF THE FIRST VOLUME.

LONDON
PRINTED BY SPOTTISWOODE AND CO.
NEW-STREET SQUARE

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